THE WORLD UNIVERSITY ENCYCLOPEDIA

6

DELUXE EDITION

The WORLD UNIVERSITY ENCYCLOPEDIA

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Unabridged

Volume 6

HOUMA–LIDICE

AN ILLUSTRATED TREASURY OF KNOWLEDGE

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Key to Pronunciation

VOWELS

ă (short), as in *hat, cat.*
ā (long), as in *ale, hate.*
ä (Italian), as in *car, mar.*
ȧ (short Italian), as in *fast, class.*
ą (broad), as in *all, fall.*
â (circumflex), as in *care, snare.*
a or *ạ* (short obscure), as in *final, spinal.*
â (long obscure), as in *surface.*
ae, as in *Caesar*, = ē.

ĕ (short), as in *net, met.*
ē (long), as in *me, eve.*
ê (circumflex = â), as in *there.*
ē̃ (tilde), as in *her.*
e or *ẹ* (short obscure), as in *patent.*
ê (long obscure), as in *delay.*
ė = ĭ, as in *pretty.*

ĭ (short), as in *hit, bit.*
ī (long), as in *kite, mite.*
ĩ (tilde), as in *sir.*
i (short obscure), as in *habit.*
î (long obscure), as in *idea.*

ŏ (short), as in *pop, hop.*
ō (long), as in *cone, bone.*

ô (circumflex = ą), as in *for.*
ô (long obscure), as in *hero.*
o͝o (short), as in *book, brook.*
o͞o (long), as in *moon, spoon.*
ọ = û, as in *word.*
ȯ = ŭ, as in *son.*
oe, as in *Phoebe*, = ē.

ŭ (short), as in *rut, cut.*
ū (long), as in *muse, fuse.*
û (circumflex), as in *turn, urn.*
u̇ (long obscure), as in *unite.*

w is a vowel only after a vowel, when it forms the second element of certain diphthongs, as in *few, how.*

ȳ (short) = ĭ, as in *hymn.*
ŷ (long) = ī, as in *by, cry.*

CONSONANTS

c (hard) = k, as in *cat, cape.*
ç (cedilla) = s, as in *cell, façade.*
ḡ (hard), as in *dog, gave.*
ġ (soft), as in *gem, gentle.*
ḵ for the German ch, as in *ich, Bach* (bäk); also = c

ü for the German ü, as in *Blücher, Grünberg.*
ö for the German ö, as in *Göttingen.*
n̲ for the French n, as in *bon, Bréton* (*brâ-tôn̲′*).
th (soft), as in *path.*
TH (hard), as in *the, father.*
ñ for the sound of ny, as in *canyon.*

MANUFACTURED IN THE U. S. A.

Houma (*hōō'mȧ*), parish seat of Terrebonne Parish, Louisiana, about 50 m. s.w. of New Orleans, on the Bayou Terrebonne and on the Southern Pacific R.R.'s. Houma is a fishing center, especially of crabs and shrimps. Oil and natural gas wells are located in the vicinity. Settled in 1820, Houma was incorporated in 1870. Population, 1940, 9,052; in 1950, 11,505.

Hound (*hound*), a class of dogs useful in hunting, noted for their ability to locate game by the scent. The best-known species include the bloodhound, staghound, foxhound, beagle, harrier, and greyhound. In the last named the scent is less acute. Hounds are noted for their docility and attachment to man. See also *Dog*.

Hourglass (*our'glăs*). See *Clock*.

Housatonic (*hōō-sȧ-tŏn'ĭk*), a river of western Massachusetts and Connecticut. It rises in the former state, flows through Connecticut, and after a course of 150 m. discharges into Long Island Sound. It passes through a rich country, affords an abundance of water power for manufacturing, and is affected by tide water for 14 m.

House (*hous*), EDWARD MANDELL, politician, born in Houston, Tex., July 26, 1858; died in New York City, March 28, 1938. Educated at Cornell Univ., he became active as a Democratic politician in Texas and was awarded the honorary title of colonel. He was a confidant of President Wilson and as such was influential at the White House. At the President's request, he visited Europe between 1914 and 1916 and in 1917 was U.S. representative at a conference to coordinate Allied military action. He was a member of the commission to negotiate the peace settlement, which included the drafting of the League of Nations Covenant. House broke with Wilson in 1919 and in 1921 published, with Charles Seymour, "What Really Happened at Paris."

Housefly (*hous'flī*). See *Fly*.

Household Arts (*hous'hōld ärts*). See *Domestic Economy*.

Houseleek (*hous'lēk*) or LIVE-FOREVER, a genus (*Sempervivum*) of about 30 species of perennial plants, grown, for the most part, in rock gardens. They are low succulents, with thick, smooth, overlapping, egg-shaped leaves, which grow in rosettes at the base of the plant. The inconspicuous flowers—pink, purple, yellow, or white—appear in flattish clusters at the end of the hairy flower stems. A popular name for one species of houseleek is hen-and-chickens; the plants spread by offset, and smaller plants grow up around the "mother." The houseleek was introduced from Europe and often escapes from cultivation.

Housemaid's Knee (*hous'mādz nē*), in medicine, an inflammation of the region between the kneepan and the skin, most frequently caused by kneeling.

House of Burgesses (*bûr'jĕs-ęz*), a legislative body chosen by the people, particularly the first representative assembly in North America, the House of Burgesses of Virginia, formed under the London Co. by the constitution granted in 1619.

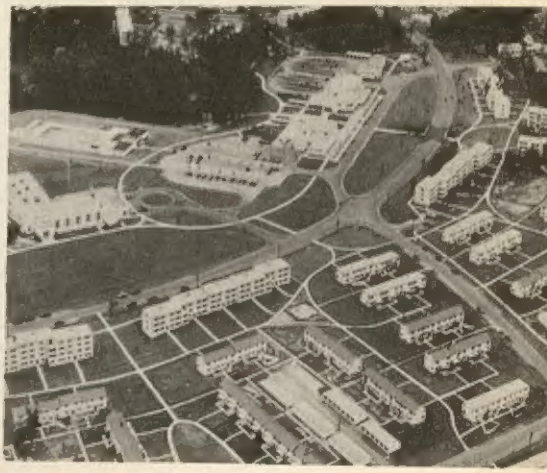
House of Representatives (*rĕp-rē-zĕn'tȧ-tĭvz*). See *Congress; Representatives, House of*.

Housing (*houz'ing*), the provision of human shelter. The attempt to satisfy the need for shelter by providing dwellings to serve economic and social needs, either as scattered dwellings, as on a farm, or by planning them as a group in an organized way to function as a neighborhood or community, is an endeavor which has a history hundreds of years old. In Germany, the great banker family of the Fuggers created settlements for their employees in the early 16th century. Monasteries and other organizations of the Church did the same for some of their parishioners, and, with the coming of the Industrial Revolution at the beginning of the 19th century, great factory owners established their workers in homes near the plant. A good example of this tendency in the U.S. can be found in the industrial town of Lowell, Mass. But it was only after World War I that planned housing on a modern scale was initiated, with Scandinavia, Switzerland, Germany, and Austria in the lead. Since housing has long been associated with social reform, Socialist governments also have favored the movement.

In the U.S., housing and community growth has largely been left to the individual and the local community. Colonists planned their first towns, usually centered on the church, the school,

GREENBELT, MARYLAND

Completed in 1937, Greenbelt is laid out in superblocks in order to provide maximum lawn and park space and a minimum of road



and the meeting house. Pioneers in the westward expansion often started communities arranged for common defense. But as industrialization and economic development grew, great cities formed, often without preconceived plan, and congestion and slums developed as older sections declined and became obsolete. Not until after the 1929 depression did the Federal government develop an active role in the support or planning of housing. Prior to that, national efforts had been confined largely to emergency needs on a small scale, such as the building of temporary villages near munitions plants in World War I. Local governments had developed minimum building and sanitary controls for housing and the regulation of zoning for urban construction as to type of use.

Courtesy British Information Services, N. Y.
SHERATON HOUSE, PIMLICO, LONDON
A postwar project at Churchill Gardens Estate

In 1932 the first national conference on home financing was held. Out of this developed a program of Federal financial support of the building and loan associations, co-operatives for home financing which had grown up over a century, to provide a stable source of home financing (see also *Savings and Loan Associations*).

In 1934 the National Housing Act was passed, creating the Federal Housing Admin., to underwrite private loans for housing and home improvement. This new system made possible long-term, low-down-payment mortgages, paid off like rent in equal monthly payments, and based on controlled standards. This government underwriting enabled lenders to lend money and buyers to buy housing on easier terms and at fair values. It resulted in steady growth of home building and in rapid expansion of home ownership, interrupted only by World War II. In 1949 new home construction for the first time passed 1,000,000 units a year, continuing at this level or higher every year, with over 13,000,000 nonfarm housing units built in the following eleven-year period. It is interesting to note in this connection that home ownership in the U.S. rose from 41.1 per cent in 1940 to 60 per cent in 1956 and to 62 per cent in 1960.

Many large apartment buildings were built in the U.S. after the war in metropolitan centers, but the home owned by a single family was by far the predominant type of new housing as the suburbs expanded. This trend was supported by expanding long-term mortgage borrowing, most of it still made privately without government support, but nearly 40 per cent of it backed by F.H.A. mortgage insurance and by government guarantees of repayment made for veterans. Total mortgage debt rose from $53,600,000,000 in 1950 to $160,500,000,000 by the end of 1960.

Courtesy British Information Services, N. Y.
BOMBAY, INDIA. MODERN APARTMENT HOUSES
A unified housing plan for the well-to-do

As home ownership grew in the U.S., demands for housing designed to serve modern living also increased. The introduction of new automatic equipment, new materials, and new design marked the postwar period, and the desires of American families were summarized from all parts of the country in 1956 in a Women's Congress on Housing held by the Housing and Home Finance Agency in Washington.

Here more than 100 homemakers discussed and developed their ideas on what a modern American family home, for the middle-income group, should contain. While there were many differences based on custom, climate, and other area factors, agreement was reached on many basic

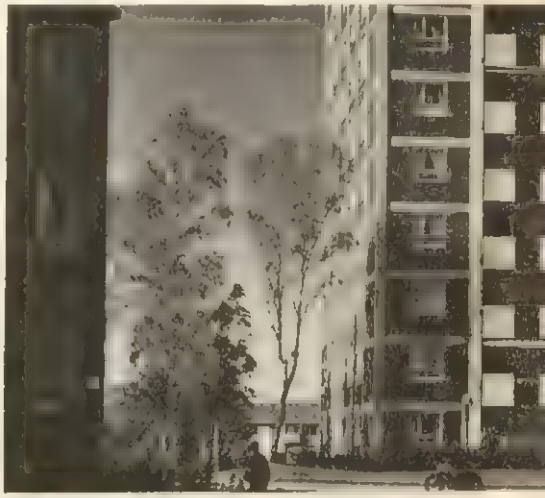
design requirements. They included: a kitchen and family area for eating and recreation clearly separated from the quiet area for sleeping and the formal area for entertaining; a laundry-utility room near the family area with a half-bath at the rear entrance for family use; a parlor-type living room with separate entrance foyer; ample closet and storage space planned for actual needs; traffic lanes which prevent walking through the living room to reach bedrooms or family rooms; indoor and outdoor play space easily seen from the kitchen area; three bedrooms, with planned built-in closet space.

The women generally agreed that a minimum family home would require about 1,200 sq. ft., but if other desired features, such as a den were included, up to 1,500 sq. ft. was desirable. The diagram below presents a graphic description of such preferable spaces and their relative locations (BR-bedroom, LR-living room, F-foyer, KFR-kitchen family room, LU-laundry utility, B-bath, BC-broom closet, $\frac{B}{2}$-half bath, GCC-guest coat closet).

Courtesy Levitt House, Inc., N. Y.

LEVITT HOUSE, NEW YORK CITY

Apartments with tenants' pool, Clearview Beach Club

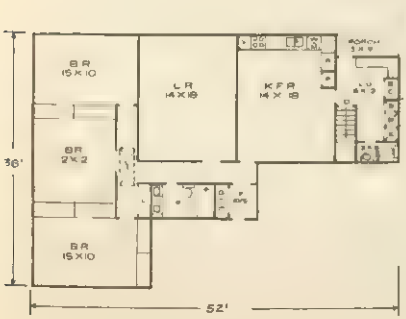


"Sweden Builds" by Kidder Smith, Reinhold Pub. Corp.

VALLINGBY, SWEDEN

High apartment house, surrounded by lower units

MINIMUM ROOMS AND SIZES



Public Housing: In addition to supporting privately financed housing, the Federal government, in the Housing Act of 1937, also initiated a program of loans and grants to local public agencies. These agencies were to build and manage low-rent housing for slum dwellers financially unable to afford good private housing. Under this program, extended at various times by Congress, 498,000 family accommodations had been completed by the end of 1961, and others were authorized.

Aid was also introduced, both for public and private housing, to assist in providing improved housing in cases where there were certain special problem needs—for minority families, whose demand and need for good housing were growing; for elderly people; for middle-income families; and for co-operative housing projects.

Urban Renewal Program: After World War II, the decline of the central cities was greatly accelerated as more and more of the urban population moved to the suburbs. Congress took note of the cities' problem by enacting the Housing Act of 1949, which greatly enlarged the public housing program and provided financial assistance to communities in clearing and redeveloping slum areas. In 1954 this program was enlarged to provide for aid not only in clearing slums but also in preventing them, by rehabilitation and conservation of basically sound areas and by requir-

ing communities to develop over-all blight-prevention programs, including a master plan for the growth of the community, modern housing codes and code enforcement, planned traffic and public works improvement, and active citizen participation.

The Housing Act of 1961 was the most recent major legislation for housing and urban problems. It not only increased funds in the urban renewal field but broadened the Federal assistance to include new programs for housing moderate-income families, for major rehabilitation of older houses, and for extended financial aid to communities so they could conserve open-space land and improve urban mass transportation systems.

By the end of 1961 more than 500 communities, ranging from the largest cities to villages of a few hundred, were actively participating in urban renewal and had more than 900 specific clearance or renewal projects under way.

In postwar Europe, rebuilding emphasis was placed on development of large modern apartment-type projects, either through the well-established co-operative systems or through direct or indirect government aid and subsidy. At the same time, housing took on new importance in underdeveloped areas of the world, such as Southeast Asia, the Middle East, and the Latin-American countries. With the growth of economic opportunity in these areas, better housing and community facilities assumed new significance economically and sociologically. An important part of U.S. foreign aid was extended to guide and help housing development in these regions through the international services of the Housing and Home Finance Agency (*q.v.*) and the International Cooperation Admin., much of it directed to basic training in use of local materials in home building with home labor and in assisting governments to set up financing aids for this purpose. See also *City Planning; Prefabrication.*

Housing, CENSUS OF, the tabulation of data concerning various aspects of dwelling units, taken in the U.S. by the Bureau of the Census. The first complete housing census was made in 1940, although statistics concerning the number of homes (*i.e.*, "family groups") have been compiled from population censuses dating back to 1850, and information on home ownership has been tabulated since 1890.

The 1960 census showed 58,323,672 dwelling units, a gain of 26.8 per cent since 1950. Occupied dwelling units numbered 53,021,061 in 1960, an increase of 23.8 per cent since 1950, and those owner-occupied increased by 39.2 per cent and numbered 32,796,087, or 62 per cent of all occupied units in 1960. Median value of nonfarm owner-occupied units was estimated at $11,900 in 1960, and median rent for nonfarm renter-occupied units was $71. In 1960, 62.4 per cent of all dwelling units were in standard metropolitan statistical areas, compared with 55.7 per cent in 1950. A comparison of the 1960 and earlier census figures shows that the average population per dwelling unit had decreased from 5.0 in 1890 to 3.3 in 1960.

Housing and Home Finance Agency (abbreviated H.H.F.A.), a Federal agency created by Congress on July 27, 1947. Succeeding the National Housing Agency, a temporary wartime agency, the H.H.F.A. is the over-all agency for carrying out the Federal government's housing programs. The H.H.F.A. works to assist and stimulate the private housing economy, to aid communities to meet urban problems beyond their local means, and to help families at all levels of need to obtain adequate housing. The agency includes as constituent agencies the Federal Housing Admin., the Public Housing Admin., the Federal National Mortgage Assn., the Urban Renewal Admin., and the Community Facilities Admin.

The Federal Housing Admin. (F.H.A.) insures housing loans made by private lending institutions. The F.H.A. has contributed to improvement in housing standards through establishment of minimum property requirements, architectural analysis, construction inspection, and establishment of methods of locating, planning, and developing subdivisions. The Public Housing Admin. (P.H.A.) extends Federal financial aid to local housing authorities, to provide low-rent dwellings for low-income families. The Federal National Mortgage Assn. (F.N.M.A.) buys and sells housing mortgages insured by the F.H.A. or guaranteed by the Veterans Admin. (*q.v.*). The Urban Renewal Admin. (U.R.A.) provides communities with monetary and technical assistance to eliminate slums and blight, develop sound urban planning, and to restore such areas to sound community assets. The Community Facilities Admin. (C.F.A.) furnishes financial assistance to communities for advance planning and construction of essential public facilities and makes housing loans to institutions of higher learning and for appropriate housing for senior citizens.

Housman (*hous'mạn*), ALFRED EDWARD, classical scholar and poet; born in Catshill, Worcestershire, England, March 26, 1859; died in Cambridge, April 30, 1936; the brother of Laurence Housman (*q.v.*). One of three children, he was educated in a private school in Worcestershire and at Oxford Univ. Subsequently he worked for ten years as a clerk in the Patent Office. One interruption during those monotonous years involved the writing, in a period of a few months, of the poems which were later published in his first

Courtesy Brown Bros., N. Y.

A. E. HOUSMAN

volume of verse. The years in the Patent Office came to an end when Housman became a professor of Latin at Univ. Coll. in London, in 1892. In 1911 he was appointed to the chair of Latin at Trinity Coll., Cambridge, where he served until 1936.

Housman's scholarly works, in addition to the articles which appeared in classical journals, include his editions of Manilius (1903-20), Juvenal (1905), and Lucan (1926). He also wrote a short critical work entitled "The Name and Nature of Poetry" (1933). The poems appeared as "A Shropshire Lad" (1896), "Last Poems" (1922), "More Poems" (1936), and "Collected Poems of A.E. Housman" (1940).

As a scholar, Housman was not only learned and keenly perceptive; he was also capable of a controversial vigor which did much to combat the follies of academic pedantry. As a poet, he has been criticized for his limited scope. Within his field, however—the depiction of unrequited love and the poignant death of the young—he was a master. His employment of popular diction and popular verse forms is melodious, dramatic, and technically flawless.

Housman, LAURENCE, author and illustrator; born in London, England, July 18, 1865; died in Somerset, Feb. 20, 1959. The brother of the above, he was educated in South Kensington. He first gained recognition as an illustrator, and most of his drawings were engraved on wood by his sister Clemence, with whom he lived most of his life. His early writings were mystical poems and legends, such as "All Fellows" (1896), "The Blue Moon" (1904), and "Cloak of Friendship" (1905). To support himself, he was art critic of the Manchester *Guardian* (1898-1914). His first fictional work was the anonymous "An Englishwoman's Love Letters" (1900). This was followed by "A Modern Antaeus" (1901) and "Sabrina Warham" (1904). Among the dramatic works are "Bethlehem; a Nativity Play" (1902), "Prunella" (1906), and "The Chinese Lantern" (1908).

He fought for women's suffrage before World War I and, turning to the current scene, wrote a number of political satires: "King John of Jingalo" (1913), "Trimblerigg" (1924), and "The Duke of Flamborough" (1928).

Housman had more than 30 plays banned in England, where the portrayal of a British monarch in his, or his children's, lifetime is prohibited. His most famous play, "Victoria Regina" (1934), was presented in England only after Edward VIII intervened in its behalf in 1936. Later works include the memorial volume to his brother—"A.E.H." (1937)—"What Next" (1938), "What Can We Believe" (1939), "The Preparation of Peace" (1940), "The Little Lover" (1940)—a set of one-act plays on St. Francis of Assisi (a theme on which he wrote 40 plays)—"Back Words and Fore Words" (1945), and an autobiography, "The Unexpected Years" (1936).

Housman received particular recognition for the mystical and devotional quality of his verse, but his versatility and enormous productivity prevented him from achieving noteworthy mastery in any specific field.

Houssay (*ōō-sī'*), BERNARDO ALBERTO, born in Buenos Aires, Argentina, April 10, 1887. After studying pharmacy and medicine in Buenos Aires, he served on the faculty of the Univ. of Buenos Aires and became one of Argentina's most eminent scientists. In 1943 he was ousted from his post for signing a prodemocratic statement. Since 1946 he has directed the institute of biology and experimental medicine at Buenos Aires which he founded with two professors who had been ousted from other institutions. Dr. Houssay shared the 1947 Nobel Prize in medicine with Drs. Carl and Gerty Cori (*q.v.*) of the U.S., receiving his share for "his discovery of the importance of the pituitary anterior lobe for the sugar metabolism." His "Human Physiology" is considered an outstanding text on that subject.

Houston (*hūs'tŭn*), a city and port of entry in southeastern Texas, seat of Harris County, largest city in the state, 25 m. N.W. of Galveston Bay, on Buffalo Bayou. It is connected to the Gulf of Mexico by a deep-water ship channel, the Houston Ship Channel, of 36-ft. depth and 300-ft. minimum width. It is served by eight railroads, including the Southern Pacific, Santa Fe, Missouri Pacific and Fort Worth and Denver R.R.'s. The Houston International Airport is about 11 m. from downtown Houston. Ellington Air Force Base and the N.A.S.A. Manned Spacecraft Center are nearby. Important landmarks include the Christ Church Cathedral (Protestant Episcopal) and the Sacred Heart Co-Cathedral (Roman Catholic), Hermann Park, with its zoological garden,

Courtesy Raymond Loewy Associates

DOWNTOWN HOUSTON

Foley's department store, one of the architectural landmarks of the city's post-World War II period

Lake Houston Memorial Park, MacGregor Park, and recently completed skyscrapers of the Texas National Bank and the Humble Oil & Refining Co. The San Jacinto Battleground, where the battleship *Texas* is now preserved, is *ca.* 20 m. S.E. of the city.

With a land area of some 330 sq. m., Houston is the center of a region which has 8.5 per cent of the U.S. oil reserves, produces 5 per cent of the nation's oil annually, and performs 40 per cent of the state's refinery operations. It is also the world's leading manufacturer of oilfield tools. The surrounding area is one of the richest producers of rice and cotton in the U.S., and Houston has about 20 cotton warehouses and terminals. The city is a major cattle and lumber marketing center and has a growing chemical industry and diversified manufactures, which include ships and steel and allied by-products. The Houston standard metropolitan statistical area (1,711 sq. m.; pop., 1960, 1,243,158) includes the whole of Harris County. The area had a value added by manufacture of $1,153,967,000 in 1958; the city's value added by manufacture in 1958 was $717,631,000.

The public-school system enrolls about 150,000 pupils annually; another 18,000 pupils are educated in parochial schools. Houston is the home of the state's second-largest university—the Univ. of Houston—of Rice Univ., of Texas Southern Univ., and of the Baylor School of Medicine, which is associated with the Texas Medical Center. A symphony orchestra is sponsored by the city, which also has several art museums and galleries and a museum of natural history.

Houston operates under the mayor-council form of government, with the mayor and eight councilmen elected to two-year terms. Founded on Aug. 30, 1836, and incorporated in 1839, Houston was named for Gen. Samuel (Sam) Houston (*q.v.*). It was the capital of the Republic of Texas, 1837-39 and 1842-45. Its rapid expansion dates from the completion of the ship canal to the Gulf in 1914. In 1900 the population was 44,633; in 1920, 138,276; in 1940, 384,514. Between 1950 and 1960, it increased from 596,163 to 938,219.

Houston, DAVID FRANKLIN, educator and public official, born in Monroe, N.C., Feb. 17, 1866; died in New York City, Sept. 2, 1940. He was graduated from South Carolina Coll. (1887) and later studied at Harvard Univ. From 1888 to 1891 he was superintendent of schools at Spartanburg, S.C. After teaching political science at the Univ. of Texas (1894-1902), he held the presidency of Texas Agricultural & Mechanical Coll. (1902-05) and of the Univ. of Texas (1905-08), and was chancellor of Washington Univ., St. Louis (1908-13). He gained national stature with his appointment as Secretary of Agriculture by President Wilson in 1913; he was Secretary of the Treasury in 1920-21. After he left the government, he was president of the Mutual Life Insurance Co. His publications include "Eight Years with Wilson's Cabinet" (1926).

Houston, SAMUEL (SAM), president of the Republic of Texas, born in Rockbridge County, Va., March 2, 1793; died in Huntsville, Texas, July 26, 1863. After the death of his father in 1807, he moved to Tennessee with his

STATUE OF GEN. SAM HOUSTON

The monument stands at the entrance to Hermann Park in Houston, Texas

Courtesy Houston Chamber of Commerce

family. He readily entered into frontier life and won recognition in the Battle of Horseshoe Bend (1814). Soon after, he studied law and entered politics. He served in Congress (1823-27) and was governor of Tennessee (1827-29). In 1829, after the breakup of his marriage, he became a trader among the Cherokee Indians. His pursuits eventually took him to Texas, where he was drawn into the rebellion against Mexico and became (1836) commander in chief of the Texas army. Houston served as president of the Republic of Texas in 1836-38 and 1841-44. Following annexation, he represented the new State of Texas as U.S. Senator in 1846-59 and served as its governor from 1859 until 1861, when his stand against joining Texas with the Confederacy led to his deposition. As a public official, he was prominent in supporting the rights of the Indians.

Hovey (*hŭv'ĭ*), RICHARD, poet, born at Normal, Ill., May 4, 1864; died Feb. 24, 1900. In 1885 he graduated from Dartmouth Coll. where he wrote songs which are still sung there. Subsequently, he studied art and theology, was a newspaper reporter, an actor, and a poet. He collaborated with Bliss Carman (*q.v.*) on "Songs from Vagabondia." His other works include "The Laurel" (1889), "Launcelot and Guenevere" (1891), "Seaward: An Elegy" (1893), "Taliesin: A Masque" (1896), and "To the End of the Trail" (1908).

Howard (*hou'ĕrd*), BRONSON CROCKER, playwright, born in Detroit, Mich., Oct. 7, 1842; died Aug. 4, 1908. He engaged in newspaper work before becoming a dramatist. His first success was "Saratoga," produced in New York City in 1870. From then until 1900, his plays appeared frequently. Other notable productions were "The Young Mrs. Winthrop" (1882), "One of Our Girls" (1885), "The Henrietta" (1887), and a Civil War drama, "Shenandoah" (1889).

Howard, CATHARINE. See *Catharine Howard.*

Howard, JOHN, philanthropist, born in London, England, Sept. 2, 1726; died in Russia, Jan. 20, 1790. He was appointed sheriff of Bedford in 1773 and his discovery of prison injustices in the local jail led to his lifelong investigation of prison conditions in England, Scotland, Wales, France, Holland, Germany, and Russia. His publication, in 1777, of "The State of the Prisons in England and Wales" resulted in a Parliamentary bill for the improvement of prisons in England.

Howard, LESLIE, actor, director, and producer, born in London, England, Apr. 3, 1893; died in May, 1943. Educated at Dulwich Coll. in London, he became a bank clerk before securing a stage role in "Peg o' My Heart" (1917). Stage and film successes followed, and he appeared on the New York stage after 1920, in such plays as "The Green Hat" (1925), "Berkeley Square" (1929), "The Petrified Forest" (1935), his own production of "Hamlet" (1936), etc. In the motion-picture field after 1930, his American successes form a long list, including outstanding performances in "Outward Bound" and in "Gone with the Wind." Returning to England during World War II, he devoted his efforts to war work, including radio broadcasts and entertaining, while he continued in the motion-picture field. He lost his life when the plane carrying him back to England from a good-will tour in Spain was shot down by German aircraft.

Howard, OLIVER OTIS, general, born in Leeds, Me., Nov. 8, 1830; died Oct. 26, 1909. He studied at Bowdoin Coll. and at West Point, where he became an instructor. In 1861 he was made colonel and for gallant service at the Battle of Bull Run became a brigadier general. At the Battle of Fair Oaks, in 1862, he lost his right arm, but subsequently commanded in the Battles of Antietam, Chancellorsville, Gettysburg, and Chattanooga, and accompanied Sherman on his march to the sea. In 1865 he became a commissioner of the Freedmen's Bureau, a position he held until it was closed in 1872. He took a deep interest in the liberated Negroes, and in 1869 was chosen president of Howard Univ. (*q.v.*) which was named in his honor. In 1877 he commanded an expedition against the Nez Percés Indians and detailed information of the campaign in his book, "Chief Joseph." The following year he defeated the Pintes, was promoted to major general in 1886, and retired in 1894.

Howard, SIDNEY COE, playwright, born at Oakland, Calif., June 26, 1891; died Aug. 23, 1939. He was educated at the Univ. of California and later studied drama with George Pierce Baker at Harvard Univ. After serving overseas in World War I he became an editor, short-story writer, and dramatist. His play, "They Knew What They Wanted," won the Pulitzer Prize in 1924. Another outstanding success was "The Silver Cord" (1928). His work was noted for candid humor, sensitivity, and expert craftsmanship.

Howard University, an institution of higher learning founded for the Negro race at Washington, D.C., in 1867. It holds high rank in all its departments, but especially in law and normal education. The faculty consists of about 470 members and the attendance is over 5,000 annually.

Howe (*hou*), ELIAS, inventor, born in Spencer, Mass., July 9, 1819; died in Brooklyn, N.Y., Oct. 3, 1867. He developed his invention of the sewing machine while working in factories at Lowell and Boston. His first machine was completed in 1845 and patented the following year. Shortly after, he sought to introduce his invention in England, but failed, and on returning to Boston found that his patent had been infringed by several manufacturers. After a litigation of seven years, the principal manufacturers were de-

Courtesy U. S. National Museum, Wash., D. C.

ELIAS HOWE

feated and agreed to pay royalty to Howe. The total fortune derived from his invention amounted to $2,000,000. He was given the cross of the French Legion of Honor.

Howe, JULIA WARD, poet and author, wife of Dr. Samuel G. Howe, born in New York City, May 27, 1819; died Oct. 17, 1910. Her education was liberal and, after her marriage in 1843, she was associated with her husband in editing the *Commonwealth,* a periodical opposed to slavery. Her essays and poems are numerous. In 1885 she was chief of the woman's department of the New Orleans World's Fair, served for a number of years as president of the woman's suffrage movement, and earned a reputation for philanthropic work. Her publications include "Passion Flowers," "Modern Society," "Words for the Hour," and "Life of Margaret Fuller." In 1862 she published the poem for which she is best known, "Battle Hymn of the Republic."

Howe, QUINCY, author, editor, radio commentator, born in Boston, Mass., Aug. 17, 1900. After being graduated from Harvard Univ. in 1921, he spent a year in England, studying at Cambridge Univ. A busy career followed, including editorial work for the *Atlantic Monthly* Co. He succeeded (1935) Clifton Fadiman as editor-in-chief of the New York City publishing firm of Simon & Schuster, Inc. News analyst on various New York City radio stations since 1939, Mr. Howe is noted for his original and keen interpretations. He did work for the OWI during World War II. His writings include "World Diary: 1929-1934" (1934), an enlightening picture of the depression years; "England Expects Every American to Do His Duty" (1937); "Blood Is Cheaper Than Water" (1939); "The News and How to Understand It" (1940); and the text to "Years of Wrath, a Cartoon History: 1931-45," by David Low (1946).

Howe, RICHARD, admiral, born in London, England, March 8, 1726; died Aug. 5, 1799. In 1740 he became a midshipman under Anson, who undertook a voyage to the South Seas. In 1758 Howe succeeded his brother as viscount of the Irish peerage and continued to render distinguished naval service during the Seven Years' War and the American Revolution. He relieved Gibraltar in 1782, for which he was made first lord of the admiralty, and in 1788 he was created an earl. He defeated the French off the coast of Brest in 1794 in the Battle of the First of June. In 1797 he was made a Knight of the Garter.

Howe, TIMOTHY OTIS, politician, born at Livermore, Me., Feb. 24, 1816; died Mar. 25, 1883. He studied law and was admitted to the bar. In 1845 he served in the state legislature of Maine, and in the same year moved to Green Bay, Wis. In 1861 he was elected to the U.S. Senate as a Republican, serving until 1879. Though offered the position of associate justice of the U.S. Supreme Court as successor to Salmon P. Chase, he declined. President Arthur appointed him Postmaster General in 1881.

Howe, SIR WILLIAM, general, born in Plymouth, England, Aug. 10, 1729; died July 12, 1814. The brother of Richard Howe (*q.v.*), he was educated at Eton, entered the army in 1746, and served under Gen. Wolfe at Quebec in 1759. In 1775 he became commander-in-chief of the British forces in America, succeeding Gen. Thomas Gage, but was superseded by Clinton in 1778. General Howe commanded in the Battles of Bunker Hill, Long Island, and Brandywine.

Howells (*hou'ĕlz*), WILLIAM DEAN, novelist, born in Martin's Ferry, Ohio, March 1, 1837; died May 11, 1920. He learned the printer's art in the office of his father and became compositor on the *Ohio State Journal* in 1856. He was consul at Venice (1861-65), where he wrote "Venetian Life." After returning to America, he worked for the New York *Times* and the *Nation* for a few months. He joined the staff of the *Atlantic Monthly* in 1866 and was editor (1872-81). He was also editor of *Harper's Monthly* (1886-91) and of the *Cosmopolitan* (1891-92). Howells is considered one of the first American realists. His best-known works include "Their Wedding Journey," "A Foregone Conclusion," "The Rise of Silas Lapham," "Modern Italian Poets," "The Coast of Bohemia," "The Quality of Mercy," "The Lady of the Aroostook," "A Modern Instance," and "A Hazard of New Fortunes."

Howitt (*hou'ĭt*), WILLIAM and MARY, two writers. The former was born in Heanor, England, Dec. 18, 1792, and, after serving an apprenticeship to a carpenter, studied literature. In 1821

he married Mary Botham. She was born at Coleford, England, March 12, 1799, and, like William, was descended from a Quaker family. In 1823 they published a volume of poems, "The Forest Minstrel." Their other publications include "The Literature and Romance of Northern Europe," "The Desolution of Eyam," and "Ruined Abbeys and Castles of Great Britain." In 1840 they removed to Heidelberg, Germany, where Mary translated some of Hans Christian Andersen's works into English. While there William wrote "The Student Life of Germany" and "Rural and Domestic Life of Germany." Subsequently they settled in Rome, Italy, where both died, William on March 3, 1879, and Mary on Jan. 30, 1888.

Howitzer (*hou'its-ẽr*). See *Gun.*

Howler (*houl'ẽr*), or STENTOR, a kind of monkey native to South America, so named from the hideous howls it utters. The hyoid bone is expanded into a hollow drum, which communicates with the larynx and acts as a resonator. In the males it is much larger than in the females. The hair is long, the tail is prehensile, and the thumbs are large. In size this monkey is the largest of America. Ten or 12 species of howling monkeys have been listed. The *ursine howler* is black or dark brown with yellow markings, and the *golden howler* has a chestnut-red color diversified with yellow on the back. The latter furnishes the principal food for the natives in many

Courtesy American Museum of Natural History

HOWLING MONKEY

parts of the Andes. Some of the species hang from the limbs of trees, suspended by their tails, and utter sounds that can be heard more than a mile at night.

Howrah (*hou'rā*), a city and district of Bengal, India, situated opposite Calcutta on the right bank of the Hugli River. The most important suburb of Calcutta, it is connected with that city by a floating bridge. Great industrial development in Howrah in the last part of the 19th century increased the population and importance of the city and it became the center of the jute-manufacturing industry. Cotton-seed oil, rope, and machinery are also produced here. The terminus of the East Indian and Bengal-Nagpur Railways, as well as of several other railways, Howrah is the seat of the Narasinha Dutt Coll. and the Bengal Engineering Coll. The municipal area covers about 11 sq. m., while the district of Howrah extends over 500 sq. m. City population, 1941, 379,292.

Hoxie (*hŏk'sĭ*), VINNIE REAM, sculptress, born at Madison, Wis., Sept. 23, 1846; died Nov. 20, 1914. As an art student she won a prize competition for a design of the statue of Abraham Lincoln which now stands in the rotunda of the Capitol in Washington. Her other works include the statue of Adm. Farragut at Washington; "Governor Samuel Kirkwood" and "Sequoyah," both in the Capitol's Statuary Hall, and "Sappho."

Hoyt (*hoit*), JOHN WESLEY, educator, born near Worthington, Ohio, Oct. 13, 1832; died May 23, 1912. He studied at Ohio Wesleyan Univ., and afterward took courses in law and medicine. He became editor of the *Wisconsin Farmer* at Madison. He was commissioner to the London Exposition (1862), to the Paris Exposition (1867) and to the Vienna Exposition (1873). He was governor of the Territory of Wyoming (1878-83), and in 1887 was chosen president of Wyoming Univ. which he had helped to reorganize. His books include "Progress of University Education," "Studies in Civil Service," and "History of University Education."

Hradčany (*ràd'chă-nĭ*), the vast palace of the ancient kings of Bohemia, in Prague. The estates of Bohemia formerly met in its council chambers, and the Emperor of Austria resided there during his visits to Prague. Adjoining the Hradčany is the famous Cathedral of St. Vitus, where the kings of Bohemia were crowned.

Hrdlička (*hûr'dlĭch-ka*), ALEŠ, anthropologist, born in Humpolec, Bohemia, March 29, 1869; died Sept. 5, 1943. He came to the U.S. in 1882 and studied at the Eclectic Coll. and Homeopathic Coll. in New York City. In 1899 he joined the physical anthropology division of the American Museum of Natural History, New York. He was with the U.S. National Museum at Washington (1903-42), becoming curator in 1910. In 1918 he founded the *American Journal of Physical Anthropology* and in 1929 became the first president of the Assn. of Physical Anthropologists. He was noted for his theory that the prehistoric settlers of America were migrants from Asia.

Hrotsvitha (*hrōt-svē'tä*) or ROSWITHA, a nun who lived from 935 to 1002 in Gandersheim, Germany. She is known as the author of six plays (in Latin). Although written in the style of the comedies of Terence (see *Terentius Afer*), they are wholly Christian in content. She was also a chronicler of the times of Otho I (*q.v.*).

Hubbard (*hŭb'ērd*), a village in Trumbull County, Ohio, 6 m. N.E. of Youngstown. It manufactures metal products and steel and is in the Youngstown-Warren Standard Metropolitan Statistical Area. Population, 1960, 7,137.

Hubbard, BERNARD ROSECRANS, priest, explorer, author, born in San Francisco, Calif., Nov. 24, 1888; died in Santa Clara, May 28, 1962. He became a member of the Jesuit order in 1908 and for the next few years taught in Jesuit institutions in the U.S. He completed his theological studies at the Univ. of Innsbruck, Austria, in 1925. The following year he became head of the geology department at the Univ. of Santa Clara and began his series of expeditions to Alaska. From these trips came the material for his books, "Mush, You Malemutes" (1932) and "Cradle of the Storms" (1935); for many theatrical shorts on "The Father Hubbard Adventures"; and for several educational films. Father Hubbard's studies centered on volcanology, glacier geology, meteorolgy, paleontology, and oceanography of the waters north of Alaska and islands of the Bering Sea.

Hubbard, ELBERT, publisher, born in Bloomington, Ill., June 19, 1859; drowned on board the *Lusitania*, May 7, 1915. He studied in Illinois and entered Harvard in 1892, at the age of 36, but soon left for a tour of Europe, where he was influenced by the ideas of William Morris (*q.v.*). He returned in 1895 and settled at East Aurora, N.Y. There he established the Roycroft Shop, where handicraft articles were made and sold and publications were hand-set and bound. He published the *Philistine*, a periodical which discussed the newest literary trends. Besides issuing pamphlets and lecturing extensively, he published "A Message to Garcia" (which had a sale of 40,000,000 copies), "Time and Chance," "The Man of Sorrows," "Consecrated Lives," and a series of studies of men and institutions under the title "Little Journeys."

Hubbardton (*hŭb'ērd-tŭn*), a township in Rutland County, Vt., 14 m. N.W. of Rutland. It is known as the site of a Revolutionary War battle, July 7, 1777, in which the British under Gen. Simon Fraser defeated the Americans under Seth Warner. Population, 1940, 346; in 1960, 238.

Hubbell (*hŭb''l*), CARL OWEN, nicknamed the MEAL TICKET, baseball player, born at Carthage, Mo., June 22, 1903. A left-handed pitcher, he joined (1928) the New York Giants, where he became known for what he called his "screwball" pitch, a left-handed ball with an unusual curve. A consistent winner, he pitched a no-hit game against Pittsburgh in 1929; in the 1934 All-Star game he struck out Joe Cronin, Jimmy Fox, Lou Gehrig, Al Simmons, and Babe Ruth. A member of the National Baseball Hall of Fame, Hubbell retired from play in 1943, becoming director of the Giants' farm organization.

Hubeny (*hōō'bē-nī*), MAXIMILIAN JOHN, radiologist, born in Leipzig, Germany, Oct. 12, 1880; died in Chicago, July 2, 1942. After receiving a medical degree in the U.S. in 1909, he studied abroad. From the beginning he centered his research on the medical application of the X-ray; his special contribution to the science was in his studies of the use of X-rays in embryology and obstetrics. In the course of his career he served as professor of roentgenology at the Cook County Graduate School of Medicine and as roentgenologist at various hospitals in Chicago.

Hubermann (*hōō'bēr-män*), BRONISLAW, violinist, born in Czentochowa, Poland, 1882; died in New York, N.Y., June 16, 1947. He made his début at the age of 11 in Amsterdam. The young prodigy impressed Johannes Brahms two years later at a Vienna appearance arranged by the soprano Adelina Patti. For the next two years Hubermann toured the U.S. and later played in almost every part of the world, achieving international repute. In 1936 he founded the Palestine Orchestra in that country.

Huckleberry (*hŭk'k'l-bĕr-rĭ*), a small shrub native to the temperate part of the Northern Hemisphere. It belongs to the genus *Gaylussacia*, and is often mistaken for the blueberry, genus *Vaccinium*. Many species are included in the genus, some of them common throughout North America. They have bell-shaped flowers and berries, each berry containing ten small nuts resembling seeds. They thrive best in the dry soil of woods and mountain sides and yield dark purple berries, which are used in preserves. Most species attain a height of from 1 to 3 ft.

Huckleberry Finn, THE ADVENTURES OF, a novel by Samuel L. Clemens (*q.v.*), published in 1884 under his pseudonym Mark Twain. It is a sequel to the author's "The Adventures of Tom Sawyer" (1876) and relates the wanderings of "Huck" and Tom after they have run away from home. The story describes the boys' adventures as they travel down the Mississippi River on a raft with the Negro Jim, their old friend. The book is considered by many critics to be Clemens' masterpiece.

Huddersfield (*hŭd'dĕrz-fēld*), a municipal, county, and Parliamentary borough in the West Riding of Yorkshire, England, on the Colne River, 16 m. S.W. of Leeds. It is noted for its manufactures of fancy woolens, as well as for woolen textiles of every kind. It also has iron foundries and cotton and silk mills. The city has

extensive railroad connections with industrial northern England. It is the seat of Huddersfield Coll., which is affiliated with the Univ. of London. Population, 1947 (est.), 123,960.

Hudnut (*hŭd'nŭt*), JOSEPH, architect and educator, born in Big Rapids, Mich., March 27, 1886. He received his education at Harvard Univ., the Univ. of Michigan, and Columbia Univ. Beginning his career as an architect and teacher in 1912, he taught at Alabama Polytechnic Inst. (1912-16) and practiced as an architect in New York City (1919-23). Later he served as professor of architecture at the Univ. of Virginia (1923-26) and at Columbia Univ. (1926-35), becoming dean of the latter's school of architecture in 1934. He has been a professor of architecture and dean of the faculty of design at Harvard Univ. since 1935. During the Hitler regime Hudnut, who has generally pioneered in modern architecture, called to Harvard many German architects, among them Walter Gropius (*q.v.*).

Hudson (*hŭd's'n*), a town in Middlesex County, Mass., 27 m. w. of Boston, on the Boston & Maine R.R. It is situated on the Assabet River and is surrounded by a productive farming country. The manufactures include clothing, boots and shoes, leather, rubber goods, and wooden containers. Population, 1950, 8,211; 1960, 7,897.

Hudson, a city in southeastern New York State, seat of Columbia County, on the Hudson River, 28 m. s. of Albany. It is served by the New York Central R.R. The city manufactures cement, matches, refrigerators, metal-working presses, beverages, and conveying equipment. The surrounding area has deposits of lime and stone and produces fruit, poultry, and dairy products. Its history dates back to 1662, when it became known as Claverack Landing. Its first real settlement came in 1783, when it was renamed Hudson; it was incorporated in 1785, and until about 1825 it was the whaling capital. Population, 1960, 11,075.

Hudson, HENRY, navigator, born in the latter part of the 16th century, but whose history before 1607 is unknown. In that year he made an expedition to find a northeast passage to China. He made a second voyage in 1608, explored the coast of Greenland, and suggested for the first time the existence of an open polar sea. In 1609 he sailed in the employ of the Dutch East India Co., under whose direction he cruised along the coast of Labrador, discovered the Hudson River, which was named after him, and sailed about 150 m. up the river. His last voyage was made in 1610, when he discovered Hudson Strait and Bay and explored a portion of their coasts. Owing to a scarcity of provisions, his sailors mutinied the following year and set Hudson, his son John, and seven of the most infirm adrift in a small boat. They were never heard from again, but the survivors reached England after much suffering. Hudson published "Divers Voyages and Northern Discoveries" and "A Second Voyage."

Hudson, MANLEY OTTMER, jurist, born in St. Peters, Mo., May 19, 1886; died in Cambridge, Mass., April 13, 1960. After he was graduated from William Jewell Coll. (1906) and Harvard Univ. (1910), he was a professor of law at the Univ. of Missouri (1910-19) and at Harvard (1919-23) where he then was Bemis professor of international law (1923-54) and editor of the *American Journal of International Law* (1924-60). A judge of the Permanent Court of Arbitration (1933-45) and of the Permanent Court of International Justice (1936-46), he became a member of the U.N. international law commission in 1946. His "International Legislation" (9 vols., 1919-45) has been considered basic to the understanding of international legislation.

Hudson, WILLIAM HENRY, author, born Aug. 4, 1841, at Quilmes, near Buenos Aires, Argentina; died Aug. 18, 1922, in London. The son of American parents, Hudson spent his youth in Argentina, going to England in 1870. An attack of rheumatic fever suffered when he was a boy left him with permanent ill health, and until the publication (1904) of "Green Mansions" with its strange and unforgettable heroine, Rima, the bird-girl, he lived in poverty and obscurity in England. After its appearance (1904) his lot was somewhat improved, although he and his wife continued to support themselves meagerly by operating a series of boarding houses. Hudson became an English citizen in 1900.

Hudson always considered himself as much a naturalist as a writer, and all his books reveal clearly his love of nature. In addition to a number of books about birds, both of England and the Argentine, and his charming novels, "Green Mansions" and "A Crystal Age" (1906), Hudson wrote "Far Away and Long Ago: A Story of My Early Life" (1918) and other works.

Hudson Bay, a large bay, or inland sea, situated in the northeastern part of North America. Its length is about 1,000 m.; breadth, 600 m.; and area, 400,000 sq. m. It is enclosed wholly by British territory, communicates with the sea through Fox Channel and Hudson Strait, and receives the drainage of a large portion of Canada. Numerous reefs and islands abound along the western shore. In the southern portion is James Bay. The streams flowing into it include the Great Whale, Churchill, East Main, Albany, Nelson, Fish, Seal, and Severn Rivers. It is open to navigation for about five months in the summer, and the remainder of the year its surface is covered with ice or largely obstructed by drift ice. Several harbors are situated in the southern part. The fur trade and white whale fisheries are especially profitable, but considerable quantities of fish are also caught in the summer season.

Courtesy American Bible Society, N. Y.

HUDSON RIVER WATER FRONT, EARLY 19th CENTURY

Hudson Falls, a village, county seat of Washington County, N.Y., located on the Hudson River and the Delaware & Hudson R.R. Incorporated as the village of Sandy Hill in 1810, it was named Hudson Falls in 1910. Paper manufacturing is the dominant industry. Population, 1940, 6,654; in 1950, 7,236.

Hudson River, an important river of New York, rising by two small streams in the Adirondack Mts., at a height of 4,325 ft. above sea level. Its course is almost due south and about 340 m. long. It flows into the Bay of New York. The Hudson is navigable a distance of 145 m. to Albany, for ocean-going vessels. Beautiful falls of 50 ft. are at Glens Falls, 56 m. north of Troy, where great water power has been developed by means of a dam. The river was named for its discoverer, Henry Hudson. Upon it sailed the first steamboat made by Fulton. Tunnels under it connect New Jersey with New York, and it is spanned by several bridges. Near its mouth are the Palisades, which rise from 300 to 500 ft. above the surface of the water. Tappan Sea, about 3 m. wide, and Haverstraw Bay are features between the Palisades and the Highlands. About 50 m. N. of New York is the West Point Military Acad., near which the historic treason of Benedict Arnold (*q.v.*) took place. The upper Hudson is noted for its precipitous banks and picturesque scenery. Albany, Yonkers, Troy, Peekskill, and Poughkeepsie are among the cities on its banks.

Hudson's Bay Company, a corporation chartered by Charles II of England in 1670, in which Prince Rupert and other noblemen were interested. The company secured sole control of the large region known as Rupert's Land, consisting of all that portion of Canada which drains into Hudson Bay. The object was to control the fur and skin trade. Later the company secured similar control of possessions extending to the Pacific, but in 1868 its rights were transferred largely to the Dominion of Canada for about $1,500,000. However, the company retained the trading privileges of a modern corporation, and a supplemental charter (1920) extended the company's trading powers.

Hué (*hōō-ā'*), a seaport city of Indo-China, formerly the capital of Annam (see *Viet Nam*). First fortified by the French in the 19th century, the city is an important military and trading center. The inhabitants are mostly Annamites, but there are also a number of Chinese and Europeans. Population, *ca.* 28,000.

Hue and Cry (*hū and krī*), a phrase that originated with the Anglo-Saxons, meaning the loud vocal outcry or alarm by which the clansmen pursued felons. If the offender could not be found, the hue and cry was raised, and all the people joined in the search until the offender was seized. For many years all persons informed of a criminal offense were by law required to raise the hue and cry, but the custom was abolished many years ago.

Hugh Capet (*hū kā'pĕt*), King of France and founder of the Capetian dynasty, born about 939; died Oct. 24, 996. He was a son of Hugh the Great and Hedwig, a sister of Otho the Great of Germany. He inherited from his father the duchy of France and the county of Paris in 956, thus taking rank among the most powerful princes of his country. On the death of Louis V, the last of the Carlovingian kings, he was selected by the nobles and bishops in preference to Charles of Lorraine as king of France. He was crowned at Noyon in 987 by the Archbishop of Rheims, but Charles immediately contested the election. The latter was captured and confined to a dungeon, where he died. After securing possession of the crown, Hugh associated his son Robert in the government, and the latter succeeded him as king of France.

Hughes (*hūz*), CHARLES EVANS, jurist and statesman, born at Glens Falls, N.Y., April 11, 1862; died in Osterville, Mass., Aug. 27, 1948. He was graduated from Brown Univ. and Columbia Law School, and was admitted to the bar in New York City in 1884. For some time he taught law at Cornell Univ. Law School and, when not serving in an official position, he was a very successful corporation lawyer.

Hughes' political success was established in 1905 when he served as attorney for a New York State legislative committee and uncovered abuses in the insurance business. The next year he was elected governor of New York on a Republican ticket, defeating Wm. R. Hearst (*q.v.*), and was re-elected in 1908. In the latter year he was promi-

nent as a candidate for President, but was defeated for the nomination by William H. Taft (*q.v.*) who appointed him to the U.S. Supreme Court in 1910. He resigned as Associate Justice in 1916 after he was defeated in the election by Woodrow Wilson (*q.v.*). President Harding appointed him Secretary of State in 1921. During his tenure, the U.S. signed a separate peace treaty with Germany and successfully introduced naval disarmament (*q.v.*). In 1928 he became a member of the World Court. President Hoover, in 1930, appointed him Chief Justice of the U.S. Supreme Court, from which position he retired in 1941. During his term of office, the high tribunal decided on much New Deal legislation. Hughes often supported the liberal viewpoint, but strenuously objected to the reorganization of the Supreme Court as suggested by President F.D. Roosevelt in 1937.

In 1947, Hughes was one of the founders of the World Council of Christians and Jews to promote religious tolerance.

Hughes, LANGSTON, writer, born at Joplin, Mo., Feb. 1, 1902. A graduate (1929) of Lincoln Univ. in Pennsylvania, Hughes' varied career has included working as writer, laundryman, seaman, gardener, etc. One of the outstanding American Negro authors of today, he excels not only in his poetry, much of which has been set to music, but also in prose. Among his chief works are: "Weary Blues" (1926), "Not Without Laughter" (1930), "The Dream Keeper" (1932), "The Ways of White Folks" (1934), "The Big Sea" (autobiographical, 1940), "Shakespeare in Harlem" (1942), lyrics for "Street Scene" (1947).

Hughes, RUPERT, author, born in Lancaster, Mo., Jan 31, 1872; died in Los Angeles, Calif., Sept. 9, 1956. He attended Western Reserve and Yale universities, worked on the staffs of *Godey's Magazine, Current Literature,* and the *Criterion,* and help to edit the "Encyclopaedia Britannica" (1902-05). He later wrote film scenarios and directed several motion pictures. Of his many novels, the best known were "What Will People Say?" (1914), "Souls for Sale" (1922), "The Patent Leather Kid" (1927), and "The Man Without a Home" (1935). He also wrote a biography of George Washington, as well as books about music, poetry, and plays.

Hughes, SIR SAMUEL, soldier, born at Durham, Ontario, in 1852; died Aug. 24, 1921. He spent his boyhood on a farm and at 14 enlisted as a militiaman against the Fenians. In 1869 he was graduated from the Toronto Normal School, taught school for several years, and subsequently engaged in business. He was elected to the Dominion parliament in 1892, was chosen minister of militia and defense in the cabinet of Sir Robert Borden, in 1911, and in 1914 undertook to organize an army to defend the mother country. He resigned from the cabinet in 1916, but remained an active supporter of military operations.

Hughes, THOMAS, author, born in Uffington, England, Oct. 20, 1823; died in Brighton, Mar. 22, 1896. He studied at Rugby and Oxford, was admitted to the bar in 1848, and became queen's counsel in 1869. In 1856 he published "Tom Brown's School-Days," a well-known work presenting a truthful picture of life at Rugby. Other publications include: "Tom Brown at Oxford," "The Scouring of the White Horse," and "Life of Alfred the Great." Later he edited Lowell's "Biglow Papers."

Hughitt (*hŭ'it*), MARVIN, capitalist, born in Cayuga County, New York, Aug. 9, 1837; died Jan. 6, 1928. He removed to Chicago in 1854, where he became a telegraph operator. Later he worked for the Chicago & Alton and the Illinois Central Railways, and subsequently held responsible positions with the Chicago, Milwaukee & St. Paul Ry. In 1871 he was made general manager of the Pullman Palace Car Co., of which he became general superintendent the next year. He was elected president of the Chicago & Northwestern Ry. in 1887.

Hugli (*hōō'glē*), or HOOGLY, an important river of India, the principal channel of the delta of the Ganges. It is formed by the confluence of three branches of the Ganges, known as the Churni, Bhagirathi, and Jalangi. It has a length of 160 m. and is navigable as far as Calcutta. The city of Hugli, population *ca.* 50,000, is located about 27 m. N. of Calcutta, on the west bank of the river.

Hugo (*hŭ'gō*), VICTOR MARIE, poet, born in Besançon, France, Feb. 26, 1802; died in Paris, May 22, 1885. His father was a general under

VICTOR HUGO
Medal by David d'Angers (1788-1856)
Courtesy Metropolitan Museum of Art, N. Y.

Napoleon. He studied at Paris and Madrid, his father holding an important position in the latter city while Joseph Bonaparte was King of Spain. He began writing tragedies and poems at an early age, and in 1822 published his "Odes and Ballads." From the French Acad. he won several prizes and likewise attained a high standing at the floral games at Toulouse. His mother died about the time he came into public notice, and at his marriage, soon after, Louis XVIII brightened his prospects by a liberal pension. In 1841 he was elected to the French Acad., was made a peer of France under appointment of Louis Philippe, and in 1848 became devoted to democratic tendencies in politics.

Victor Hugo opposed Louis Napoleon in his ambitions, and in 1852 published his memorable philippic, "Napoléon le Petit," against him. He was banished and sought a refuge in Brussels, but finally settled in Jersey and the neighboring island of Guernsey, where he produced a number of works against Napoleon. While there he wrote most of the books which have made his name famous. The writings of Hugo occupy a high position in the literature of France, and, for that matter, of the world. They have gone through many translations and editions. He was the foremost man of letters of his time and gave to literature some exquisite gems. He ranks highest as a poet, though his novels and dramas show much genius. Among his best-known works are: "Les Misérables," "Notre Dame of Paris," "Marie Tudor," "The Man Who Laughs," "Speeches and Addresses," "Meditations," "Les Orientales," the drama "Hernani," "Marion Delorme," and "Letters of Victor Hugo," edited by Paul Maurice. His last novel, "Ninety-Three," was published when he was past 70 years of age.

Huguenots (*hū'gê-nōts*), a term which probably originated from Hugues, an obscure religious advocate, or from a reference to King Hugo, and applied to the Protestants of France during the Reformation and in the religious struggles of the 16th and 17th centuries. Among the early Protestants of France were Farel and Margaret of Valois, sister of Francis I and Queen of Navarre. The earliest French Protestant Church was founded at Strasbourg under John Calvin (1538). The movement was opposed by Francis I, later by Henry II, husband of Catherine de' Medici. However, the Reformation made powerful advances in France. In the reign of Francis II it was headed by the Bourbon family and supported with vigor by the Queen of Navarre and the Prince of Condé. The Guises led the Catholic party. Under their leadership a fanatical persecution of the Protestants was pursued and many were executed or banished and their property was confiscated. The events rapidly formed under which the Protestants took up arms. They named Louis I, the Prince of Bourbon-Condé, as their leader, and at a meeting in Nantes, on Feb. 1, 1560, resolved to petition the king for the removal of the Guises and the freedom of religion. It was also agreed that, if the petition were ignored, the king should be seized and Condé proclaimed regent of the realm. The king was informed of the intention and fled to Amboise, and 1,200 Protestants were made prisoners and executed.

After the death of Francis, in 1560, it became necessary for Charles IX and his mother, Catherine de' Medici, to curb the power of the Guises by encouraging the Protestants. Accordingly, the Guises were removed, an edict freeing the Huguenots from penalty of death was issued, and in 1562 they received the freedom of religious worship on their own estates. An attack made by adherents of the Duke of Guise on a Protestant meeting, in 1562, brought about a prolonged series of religious wars, by which France suffered great losses of life and property for many years. The Protestants were defeated at Dreux by the Duke of Guise, but he was assassinated on Feb. 18, 1563, while marching upon Condé at Orleans. The Peace of Amboise, concluded by Catherine, granted freedom of religion in many portions of France, but an alliance with Spain caused a renewal of hostilities and the execution of about 3,000 Huguenots. Condé was killed in battle at Jarnac on Mar. 3, 1569, and Catherine soon began to plan the suppression of the Protestants by a general massacre. This scheme was inaugurated in 1572 by the Massacre of St. Bartholomew's Day, and within a few months thousands of Protestants were slain in France. The Protestants fled for protection to their fortified towns and carried on a defensive war with varying success until 1580, when peace was concluded.

In 1584 Henry of Navarre became heir to the throne through the death of the Duke of Anjou, but the Duke of Guise laid claim to the throne of France. He revived the Holy League, formed an alliance with the Pope and Spain to exterminate heresy, and inaugurated the so-called "War of the Three Henries." The Protestants secured troops from Germany and some from England, and under the leadership of Henry of Navarre presented a formidable opposition. In this conflict the Duke of Guise, Cardinal Lorraine, and the King of France were assassinated, and Henry of Navarre ascended the throne. On Apr. 13, 1598, the famous Edict of Nantes was issued, by which the Protestants were given freedom of worship. Previous to this, in 1593, Henry of Navarre had gone over to the Catholic party for the purpose of maintaining himself on the throne.

In the meantime the Protestant influence continued to develop, and successive hostilities oc-

curred in 1615, 1622, and from 1624 to 1628, when a war was waged against the Protestants by Richelieu, which ended in the latter year by the capture of the Huguenot stronghold, La Rochelle. The peace terms of 1629 permitted them freedom of conscience, which they continued to enjoy under Cardinal Mazarin. Louis XIV, however, in 1685, revoked the Edict of Nantes, and a wave of violent persecution of the Huguenots followed. Thousands of Huguenots, therefore, migrated to Germany, The Netherlands, Switzerland, England, and the U.S. They did not attain religious freedom in France until the Revolution of 1789.

In the American colonies, Huguenots settled as early as the 16th century in the Carolinas and Virginia. After revocation of the Edict of Nantes, they immigrated in increasing numbers, especially to South Carolina, Pennsylvania, and New York. One of the best-known settlements in New York was at New Rochelle, founded in 1688.

Huitzilopochtli (*wē'sē-lē-pōch-tlē*), in Aztec mythology, the chief god; he was also the god of war. Many human sacrifices were offered to him at the great temple to him which once stood in a section of what is now Mexico City.

Hulagu Khan (*hōō-lä'gōō khän*), Mongol khan, born in 1217; died in 1265. The grandson of Genghis Khan, he was the brother of Kublai Khan and Mangu Khan. After putting down a Persian revolt for Mangu in 1252, he virtually wiped out (1256) the Assassin sect in Persia. He took Bagdad in 1258, deposing the Abbassides (*q.v.*); he took Syria, Aleppo, and Damascus and curbed the Seljuks in Persia. In 1260 he suffered a military defeat by the Egyptian Mameluke sultan. Soon afterward, he became a Moslem.

Hull (*hŭl*), county seat of Wright County, Quebec, on the Ottawa River, opposite the city of Ottawa. It is on the Canadian Pacific Ry. The Ottawa River is crossed by two extensive bridges, the Chaudière Bridge, over the Chaudière Falls, and the Interprovincial, or Alexandria Bridge, a short distance farther downstream at Nepean Point. Noteworthy buildings include the churches of the Holy Redeemer, Notre Dame de Grace, and Church of St. James, Notre Dame Coll., and the Notre Dame Hall. A prosperous trading center, it has manufactures of cement, lumber, and paper and pulp and is the site of a hydroelectric power plant. Iron mines are near by. Hull was first settled in 1800 and was incorporated in 1870. It suffered greatly by a fire in 1900, but has been rebuilt. Population, 1951, 43,483.

Hull, a county borough of England. See *Kingston-upon-Hull.*

Hull, CORDELL, statesman, born in Pickett, Tenn., Oct. 2, 1871; died in Bethesda, Md., July 23, 1955. He was graduated from Cumberland Univ. in 1891. Admitted to the bar, he began the

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practice of law and entered politics as a member of the house of representatives in 1893, where he served two terms. In 1903 he was appointed judge of the fifth judicial circuit of Tennessee. In 1906 he re-entered politics and became a member of Congress. He introduced the Federal income tax system of 1913 and was the initiator of the revised act of 1916 as well as of the Federal Inheritance Act of 1916. Elected to the U.S. Senate in 1930, he distinguished himself for his unique economic talent, exercised to secure reforms both in internal and external affairs. He was Secretary of State under President F.D. Roosevelt, 1933-44, holding that post longer than any other man, and was a strong advocate of the "good neighbor" (*q.v.*) policy and reciprocal trade agreements. He foresaw World War II as early as 1936 and warned of possible Japanese attack. Known as "The Father of the United Nations" (*q.v.*), Hull was awarded the Nobel Peace Prize for 1945 for his promotion of international cooperation and good will. He represented the U.S. at the Moscow Conference (1943) of foreign ministers of the "Big Three" Powers, preparing for united action in political postwar developments. His "Memoirs" were published in 1948.

Hull, ISAAC, naval officer, born in Derby, Conn., March 29, 1773; died in Philadelphia, Pa., Feb. 13, 1843. A nephew of William Hull, he became a lieutenant in 1798, serving with credit in the West Indies and in the Mediterranean. In 1806 he became a captain and commanded the *Constitution* in the War of 1812, in the course of which occurred its famous defeat of the British frigate the *Guerrière.* After this victory the *Constitution* became known as *Old Ironsides,* and Hull was granted a gold medal by Congress. Subsequently, he commanded a squadron in the

Pacific and in the Mediterranean, and retired in 1841.

Hull, WILLIAM, general, born in Derby, Conn., June 24, 1753; died in Newton, Mass., Nov. 29, 1825. In 1775 he was admitted to the bar, joined the American army at Cambridge, and fought as captain at White Plains, Trenton, and Princeton. He led a column in the assault on Stony Point, after which, in 1779, he was promoted to the rank of lieutenant colonel. He commanded the northwestern army in the War of 1812 and with a force of 1,500 men defended Detroit. He considered himself compelled to surrender to the British and yielded without making material resistance. For this he was tried by court-martial and sentenced to be shot, but President Madison pardoned him on account of his previous service.

Hull House, a social settlement in Chicago, situated at 335 South Halstead Street. It was founded by Jane Addams and Ellen Starr in 1889, and was so named from Charles J. Hull, who occupied the site as a tenement residence and junk shop. The portion of the city surrounding the site is occupied largely by foreigners, including chiefly Jews, Italians, and French. Under wise management, the institution has been made highly beneficial, and its property includes a gymnasium, a library, a coffeehouse, and numerous buildings used in educational and industrial work. The Hull House is a leader in the social settlement movement of North America, and many of its former residents have held responsible positions in city and state offices and in industrial enterprises.

Humacao (*ōō-mä-ḳä'ō*), the capital of the municipality of Humacao, Puerto Rico, near the eastern coast, on the Roig Road, which connects it with the harbor 6 m. distant. It is a picturesque village with nearby orange and pineapple plantations; its industries include fruit packing, cigars and sugar factories, and a large local trade. It was settled about 1510. Population, *ca.* 6,000.

Humanism (*hū'mān-ĭzm*), an approach toward life based on elementary traditions of antiquity. Generally the term refers to periods of civilization whose learning, literature, art, and philosophy were based on the so-called classical periods of Greek and Roman culture. We may differentiate between the following meanings of the word: *historical humanism; ethical humanism; philosophical humanism; sociological humanism; religious humanism; literary humanism.*

During the Renaissance, the period in cultural history which called itself the "humanistic period," classical learning and the study of antique works of art were put in the foreground, in contrast to the ecclesiastical studies of the Middle Ages. This tendency, as well as similar attitudes in later periods, is called *historical humanism.*

Since *humanitas* is the Latin word for being humane, humanism in Roman civilization signified a well-balanced development of the human being, where character and intellectual values were cultivated equally. Since the Romans correctly believed that such a harmonious education could be achieved only by those familiar with the works of the great Greek poets and philosophers, the word *humaniora* (meaning the intrinsic values of humanism) signified already by the time of Cicero (106-43 B.C.) a good knowledge of literature and the arts. That connotation remained connected with the word throughout the Middle Ages, when the writings of the Greek and Roman authors were studied in the monasteries and represented the only other source of knowledge and education besides the study of the Bible and the writings of the church doctors.

As early as the end of the Middle Ages, these humanistic studies were not only more and more intensely pursued, but increasingly influenced the writings of the leading authors (see *Giovanni Boccaccio, Dante Alighieri, Francesco Petrarch*). With the general revival of antiquity in the fine arts at the beginning of the Renaissance, interest in the works of ancient writers spread widely, and topics from Greek and Roman myths and poetry became as well known to the general public as the stories from the Old and New Testaments. The contents of most of the paintings of this period proved the equal interest in both realms. Even the beginnings of modern theater, except for those which are rooted in the medieval mystery play, go back to humanistic studies and to the attempt to revive tragedies and comedies of ancient writers.

Although this movement took place during the 15th century in Italy, it was slower in spreading to the rest of Europe, moving northward only at the turn of the century and during the 16th century. Some of the greatest and best-known men of this epoch in Northern Europe, such as Erasmus of Rotterdam, Johannes Reuchlin, and Philipp Melanchthon (*qq.v.*). considered themselves primarily as humanists and the study of the ancients was a matter of course for them. It was the ambition even of princes and emperors of this time to be called good humanists.

Soon the whole movement inundated the higher schools. In the monastic schools during the Middle Ages, the study of Greek and Latin had already become almost as important as the study of the theological disciplines. Now even the worldly schools became "gymnasia," schools for Latin and Greek studies, while all other fields were increasingly neglected. The pedantry of these "gymnasia" made humanistic studies in the 17th and 18th centuries the symbol of a pedantic, philological attitude more and more remote from the interests of real life.

The ascendancy of natural science studies of living languages, etc., in the 19th and 20th centuries, put humanistic thoughts in the background and the mechanistic civilization of the century helped this trend. It was only after World War II that humanistic studies were revived to any considerable extent, although they have always been of foremost importance for Catholic scholars and writers. Leaders of 20th-century humanism in the U.S. were Chancellor Robert M. Hutchins and Professor Mortimer Adler, of the Univ. of Chicago, Stringfellow Barr, former president of St. John's Coll., and Mark Van Doren, of Columbia Univ. In this connection it should again be emphasized that humanism definitely does not mean mere studies or mere interests in antiquity, but presupposes always a harmonious development of the human character.

While the above outline represents the general tendencies of humanism, the following short definitions may explain the meaning of special terms:

Ethical humanism is any kind of movement where the interests of humanity as such are preponderant. Thus, the Society for Ethical Culture, the various pacifistic movements, the movements which lead fights for minorities, may all be called humanistic movements. Considered from this point of view, almost all religious movements automatically contain humanistic elements.

Philosophical humanism is a term which is sometimes used for pragmatism (*q.v.*), as it was developed by Charles S. Peirce and William James. Since James interpreted pragmatism as the conviction that "the end of man is action," and since all philosophical endeavors are connected with man and mankind, the word humanism could be applied to the system of pragmatism, although some of its ideas are definitely contradictory to humanism as defined above.

Sociological humanism is a term which is used to define trends in applying typical characteristics of very close human relations as they prevail between families, common members of a small community, etc., to larger impersonal groups. The ideals of sociological humanism are achieved when loyalty, pity, mutual service, and love outline the relationship of all men to each other and not only the relationship between members of a small group. Thus, sociological humanism becomes almost identical with what is more generally called humanitarianism.

Religious humanism is a movement which developed from Unitarianism (*q.v.*), and which is best defined by a sentence from the so-called Humanist Manifesto (1933): "Religion consists of those actions, purposes, and experiences which are humanly significant. Nothing human is alien to the religious. . . ." In other words, any metaphysical motivation for ethical behavior is denied. The Christian humanists base their way of life on human values. The future life is not held out as a reward or a punishment for ethical behavior. In many ways, this concept is based on the theories of A. Comte (*q.v.*).

Literary humanism is the term for an American movement, which is actually half philosophical, half literary. It was founded by Irving Babbitt and Paul Elmer More in the early 1900's. Its central idea is that man's place in the universe allows the free will to be guided by intuition. Man may strive for his own progress, unhampered either by theological or by scientific determinism (*q.v.*). Thus, he has to fight against inhibitions of theological systems of the past as well as against so-called modern mechanistic materialism. The intuition which leads a man means "liberation from outer constraints and subjection to inner law." It is only logical that representatives of these ideas have found classical art and the philosophy of antiquity the human expressions nearest to their convictions and that they have considered these as the real crystallizations of cultural values. Furthermore, they have objected to the romanticism and materialistic naturalism of the enlightenment, since both made men appear irresponsible.

Human Understanding, ESSAY ON THE, work by John Locke (*q.v.*). See also *Epistemology*.

Humbert I (*hŭm'bĕrt*), EMMANUEL EUGENE, King of Italy, eldest son of Victor Emmanuel II, born Mar. 14, 1844; assassinated July 29, 1900. In the war of Italian independence, in 1859, he accompanied his father, and aided in uniting the Italian states. He took the field against Austria in 1866 and was present at the Battle of Custozza. In 1868 he married his cousin, Princess Marguerite of Savoy, and on the death of his father, Jan. 9, 1878, succeeded to the throne of Italy. An attempt to assassinate him the first year of his reign failed, and he commuted the death sentence of the assassin to life imprisonment at hard labor. He exposed himself frequently by endeavoring to relieve the sufferings of the sick and dying during the cholera epidemic at Naples, and by these and other acts of kindness won the affection of his people. His administration was eminently successful. Within the period of his reign educational and industrial arts were encouraged. On July 29, 1900, while returning from a review of educational exercises, he was assassinated by an Italian who went from Paterson, N.J., for that purpose. His early death was greatly mourned by his subjects. He was succeeded on the throne by his son, Victor Emmanuel III, who was born in Naples, Nov. 11, 1869.

Humbert II, former King of Italy, born Sept. 15, 1904, only son of King Victor Emmanuel III. After Mussolini came to power, Humbert was demoted from heir-apparent to the throne to Prince of Piedmont, but was given army rank.

At the outbreak of World War II he was placed in command of Italy's northern army, and within two years had been promoted to marshal. After Mussolini's defeat there was strong pressure for the abdication of King Victor Emmanuel III because of his co-operation with the Axis powers, and finally, on May 9, 1946, he gave up his throne in favor of Humbert, who became King Humbert II, fourth King of Italy. Loyalty to the monarchy seemed still strong, however, but in a plebiscite, held the following month, the Italian people voted for a republic, and Humbert, who had been king for only 35 days, went into exile.

Humboldt (*hūm'bōlt*), an inland river of Nevada, rises by two forks in Elko County, and after a course of 390 m. flows into Humboldt Lake, an inland body of water in the western part of that state, about 4,000 ft. above sea level. The Humboldt River is remarkable because its water contains a large percentage of soda. It flows through an arid valley which has large tracts of sagebrush. The dry air causes the water to evaporate and become less in volume toward the mouth. The river is followed from its source to its mouth by the Western Pacific R.R.

Humboldt, FRIEDRICH HEINRICH ALEXANDER, BARON VON, naturalist, born in Berlin, Germany, Sept. 14, 1769; died May 6, 1859. His father was an official to the King of Prussia and died when young Humboldt was about 10 years of age. He studied in Frankfort, Berlin, and Göttingen, and subsequently studied at the Commercial Acad. in Hamburg. At Freiberg he studied mining and botany in 1791, and soon after was appointed overseer of a mine in Franconia. A scientific tour along the Rhine, which included visits to France, Belgium, Holland, and Switzerland, led to many useful discoveries, and in 1797 he resolved to make a scientific journey to the Tropical Zone. He sailed with Aimé Bonpland, who became his associate, in June 1799, and the following month landed at Cumana, South America. He spent five years exploring the regions now included with Ecuador, Peru, Colombia, and Venezuela, cruised on the Orinoco and other rivers, and visited the West Indies and Mexico. In 1804 he returned to Europe, taking with him many specimens in botany, zoology, geology, and geography, together with copious notes in these branches and in political economy and ethnology. About 20 years were spent in preparing his great work upon the researches made in America, a publication entitled "Voyages to the Equinoxial Regions of the New Continent." While preparing this work he resided in Paris, but in 1837 settled in Berlin, where he received high recognition by the government of Prussia.

In 1829 Humboldt made an expedition to Central Asia and Siberia for Czar Nicholas, in which he explored the Ural and Altai Mts., the Caspian Sea, Chinese Dzungaria, and other points of interest. These explorations resulted in his publication, "Central Asia." Subsequently he entered the diplomatic service of Prussia, holding positions at Paris, London, Copenhagen, and other European courts. The works of Humboldt distinguish him as one of the foremost naturalists of the 19th century. His works are authoritative and have been translated into many modern languages. His researches cover important phases of geography, electricity, meteorology, climatology, magnetism and various departments of zoology and botany, such as the hibernation of crocodiles, the breathing of fishes, and the growth of tropical plants. Among the important publications not named above are: "On the Irritability of the Muscular and Nervous Fibers," "Views of Nature," "Geology and Climate of Asia," "Mineralogical Observations of Basalt," and "Cosmos."

Humboldt, KARL WILHELM VON, author and statesman, eldest brother of the preceding, born in Potsdam, Germany, June 22, 1767; died Apr. 8, 1835. He studied in Berlin, Frankfort, and Göttingen, traveled extensively in France, Spain, and Switzerland, and attained to the rank of counselor of legation. In 1791 he married and settled at Jena, where he became associated with Schiller. He exercised a marked influence in the educational affairs of Prussia. He was appointed Prussian minister to Rome in 1801, where he became a generous patron of artists and men of science. After returning to his native country, he became minister of public instruction, and was instrumental in founding the Univ. of Berlin. In 1810 he was appointed ambassador to Austria, was influential in concluding the Peace of Paris in 1814, and took a prominent part in the Congress of Vienna in 1815. He retired from active politics in 1819 and settled at Tegel, where he laid out fine gardens, collected works of art by the master artists, and devoted himself to literature. His knowledge of modern and ancient languages was extensive. He was fluent in the use of the Basque tongue, several languages of the Orient, and those of the South Sea islands. His writings include: "Aesthetic Essays," "On the Kawi Language of Java," "Original Inhabitants of Spain in Connection With the Basque Language," "Diversity of Language and Its Influence on the Diversity of Speech," "Additions and Corrections to Adelung's Mithridates," and "Letters to Lady Friend."

Hume (*hūm*), DAVID, philosopher and historian, born in Edinburgh, Scotland, Apr. 26, 1711; died Aug. 25, 1776. His father was the "laird" of Ninewells in Berwickshire, but, as Hume was the youngest son, he was slated to take up a profession. He studied law at the Univ. of Edinburgh, but soon became more interested in literature and philosophy. Retiring to France on a small income in 1734, he spent a number of

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years preparing his "Treatise of Human Nature," published in London, 1739-40. Although this was a work of great merit, now esteemed as one of the great British philosophical works, it attracted little attention at the time. His "Essays: Moral, Political, and Literary" (1741-42) had a much greater success than his first work, but Hume was compelled to seek other means of earning a living. Rejected as a candidate for a chair of philosophy at the Univ. of Edinburgh because he had gained a reputation for heresy, skepticism, and atheism, Hume obtained (1744) a post as tutor to an insane nobleman, the Marquis of Annandale. In 1746 he became secretary to Gen. St. Clair, whom he accompanied to France and later to Vienna and Turin. In the meantime, he was occupied with various works on philosophy and history. He published "Enquiry Concerning Human Understanding" (1748), "Enquiry Concerning the Principles of Morals" (1751), and "Political Discourses" (1751).

In 1752 Hume was appointed librarian of the Advocates' Library in Edinburgh, and there began to write his "History of England." The first volume of this work, covering the reigns of James I and Charles I, appeared in 1754. Hume later worked backward to the Norman Conquest and added notes to his former work, publishing the last volume of his history in 1762. Although some of his statements seemed biased, his work remained a standard work for many years, and portions of it are still widely accepted. During the same period, he also published "Essays and Treatises on Several Subjects" (1753) and "Four Dissertations: The Natural History of Religion; of the Passions; of Tragedy; of the Standard of Taste" (1757).

In 1763 Hume became secretary to the Earl of Hertford, then ambassador to Paris, and was received in the literary circles of France with much enthusiasm. He made the acquaintance of Turgot, Diderot, D'Alembert, Buffon, and Rousseau; the latter accompanied him to England in 1766. Hume served as undersecretary to Gen. Conway at the foreign office from 1767 to 1769 and retired to Edinburgh in 1770.

Hume's "Dialogues on Natural Religion" were published posthumously in 1779, and a complete edition of his philosophical works was published in four volumes in 1874-75.

Hume is important chiefly for the influence which he exerted on all later philosophers. He first adopted the point of view of Bacon (*q.v.*), Locke (*q.v.*), and Berkeley (*q.v.*); however, he developed their concepts in accordance with the general trends of his century, that of the enlightenment. In his opinion, the content of our consciousness consists of impressions on the one hand and ideas on the other hand. Our impressions are based on the sensuous sensations and are logically either simple or complex. Our ideas are copies of reflected sensations. Our knowledge is based upon the comparison of ideas, like mathematical statements, or facts of our sensuous experience. Everything beyond that which we hold in our consciousness is derived from memory and logical conclusions, which themselves refer to the relation between cause and effect. This relation, however, is based on experience, and does not have to be accepted *a priori*. Experience proves simply that similar causes lead to similar effects. Thus, all knowledge is based directly or indirectly on experience. No metaphysics exists.

Hume's skepticism is expressed most clearly by the statement that since our senses may deceive us, we do not know anything about the things themselves. We know of them only through our ideas, which may be sheer imagination. Logically, the existence of God and immortality, the idea of good and evil, of freedom of will are reduced by Hume to imaginative habits of thinking and to social tradition. This skepticism, which had never previously been evolved so clearly, exerted a great influence on Immanuel Kant (*q.v.*).

Hume, FERGUS, novelist, born in England, July 8, 1859; died July 13, 1932. He was taken to New Zealand at an early age, where he attended the high school at Dunedin and the Univ. of Otago. Later he was admitted to the bar, resided three years in Melbourne, Victoria, and in 1888 toured Europe. His writings were widely read. They are characterized by vividness of detail and imaginative power. They include: "The Island of Fantasy," "Mystery of a Hansom Cab," "Aladdin in London," "The Indian Bangle," "The Crime of the Crystal," "The Golden Wang-Ho," "The Turnpike House," and "Shylock of the River."

Humerus (*hū'mēr-ŭs*), in anatomy, the bone of the upper arm, from the shoulder to the elbow, which is subdivided into a shaft and two globular extremities. The elbow joint fits, in ball-and-socket manner, into the lower global extremity.

Humidity (*hū-mĭd'ĭ-tĭ*), the amount of moisture in anything, especially the atmosphere. Air usually contains some water in vapor form. The *absolute humidity* of air is the amount of water it contains in grams per liter, or in pounds per hundred cubic feet. Under *relative humidity* is meant the amount of water in the air as a percentage of the maximum amount that it could hold at that temperature. When air is heated, its absolute humidity remains the same, but its relative humidity decreases, because air can hold more water vapor at a higher temperature. For this reason, the relative humidity is usually lower in the middle of the day than in the morning or evening. See also *Air; Atmosphere.*

Hummingbird (*hŭm'ĭng-bûrd*), the name given to the birds of the family Trochilidae because of the sound made by their wings in hovering flight. They are found only in the Americas and are most abundant in the tropics. Most of the 330 known species are small, and the bee hummingbird of Cuba is the smallest of all birds. The giant hummer of the Andes, however, is about as large as a phoebe.

Most hummingbirds, especially the males, but sometimes both sexes, have glittering metallic colors somewhere in the plumage, particularly on the throat and cap but often over the whole plumage. Ornamental crests, gorgets, and trains are sometimes developed. Various species, however, are dull in color. The bill is slender and usually straight or slightly curved, but in certain species it is curved to a third of a circle. In the sword-billed hummer of the Andes, it is straight and as long as the rest of the bird.

Hummingbirds feed on small insects and nectar taken from flowers while hovering before them. Many of the species have weak voices, but some of them are quite noisy, but not musical. The nests are compactly built of delicate fibers and saddled on a limb or twig where they may resemble a knot on the bark. The two eggs are unmarked white. Hummingbirds are noted for their ability (shared by some other birds) to fly backwards for short distances, commonly while backing away from a flower. The wing-beat of most species is extremely rapid, having been determined for one species as 50 or 55 beats per second while hovering and as much as 75 per second in short, darting flight. A few of the larger species, however, have a wing-beat slow enough to be visible to the unaided eye.

Humperdinck (*hōōm'pĕr-dĭnk*), ENGELBERT, music critic and composer, born in Siegburg, Germany, Sept. 1, 1854; died in Neustrelitz, Sept. 27, 1921. He studied at the conservatories of Cologne and Munich and was much influenced by Richard Wagner (*q.v.*) whom he assisted in the production of "Parsifal." His best-known opera is "Hänsel und Gretel" (1893), a charming

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musical presentation of Grimm's famous fairy tale. *"Die Königskinder"* (1910) also received favorable comment, but his four other operas passed unnoticed. A deft composer of incidental dramatic music, Humperdinck wrote the music for Maurice Maeterlinck's "The Blue Bird" (1910) and for Max Reinhardt's presentation of "The Miracle" (1911) by Karl Vollmöller (1878-1948).

Humphrey (*hŭm'frĭ*), DORIS, dancer and choreographer, born in Oak Park, Ill., Oct. 17, 1895; died in New York, N.Y., Dec. 29, 1958. She studied and danced with the Denishawn group under Ruth St. Denis and Ted Shawn (1917-28) and founded (1928) a school of dance with Charles Weidman, with whom she was associated until arthritis caused her retirement from dancing in 1945. She choreographed "Sing Out, Sweet Land," a Broadway show (1945); and created many original dances, such as "Lament for Ignácio Sánchez Mejias" (1946), for José Limón, when she was artistic director of his troupe. She joined the faculty of the Juilliard School of Music in 1951 and organized the Juilliard Dance Theatre in 1955.

Humphrey, GEORGE MAGOFFIN, business executive and cabinet member, born in Cheboygan, Mich., March 8, 1890. A graduate (1912) of the Univ. of Michigan law school, he practiced law in Saginaw, Mich., until 1918 when he was appointed general attorney of the M. A. Hanna Co., manufacturers of steel. He later became president (1928) and chairman of the board (1952) of the company. He served (1948-49) as chairman of the industrial advisory committee of the Economic Cooperation Admin. (ECA). Humphrey served as Secretary of the Treasury from 1953 to 1957; former Deputy Secretary of Defense Robert B. Anderson was announced as his successor.

Humus (*hū'mŭs*), an important soil constituent derived from the decay of dead plant and animal material by the action of fungi and bacteria. It consists chiefly of the remains of roots, stems, and leaves, with their cellulose and lignin in all stages of decomposition. Its chief values are in its water-holding capacity and in the plant

food materials which are gradually released. Farmers often add humus to the soil in the form of animal manures, chiefly partly digested plant material, and by plowing under variously specially grown crops as green manure.

Hunan (*hŏŏ-nän'*), a semimountainous province of south central China, drained by the Siang, Yuan, and Tzu rivers, which empty into Tungting Lake in the northeast. On its west and southwestern borders lie the Nan Ling Mts.; in the east central part is the Heng, one of the sacred mountains of China. The river valleys and the lowland area around Tungting Lake, known as the "ricebowl," yield abundant rice, cotton, tea, and tobacco. One of the principal mineral districts of China, Hunan contains vast stores of antimony and coal. Lead, zinc, manganese, iron, and tin are also found. The capital is Changsha on the Siang River. Other large cities are Siangtan and Changteh. Area, *ca.* 79,500 sq. m. Population, 1952, 30,012,000.

Hundred (*hŭn'drĕd*), an ancient territorial division of England, which occupied an intermediate place between the villa and the shire or county. The name probably originated from a convenient grouping of 100 families for local government. It is thought to have been a Danish institution, adopted by King Alfred about 897. The name *wapentake,* which has reference to the military side of the organization, is generally connected with the Danish occupation. During the Middle Ages, the hundred was chiefly important for its court of justice; indeed, the term hundred was applied to the court as well as to the district over which the court had jurisdiction. The hundred courts declined rapidly under the Tudors; they were abolished by the middle of the 19th century.

Hundred Days, a term applied to the second reign of Napoleon I as Emperor of France. It began on March 20, 1815, when he entered Paris after his escape from Elba, and ended on June 28 of the same year, when Louis XVIII was restored to power. Having heard that the restoration of the Bourbon monarchy was unpopular in France, Napoleon escaped from Elba with a handful of men. He had only to appear and the French soldiers, stirred by the memories of his past glories, rallied to his support. Within three weeks he was in Paris, again the master of France. A shrewd politician, whose techniques had been perfected during the revolution, he promised the citizenry peace and a representative government. The dramatic episode, however, was destined for disaster, since the allies, who were still meeting at the Congress of Vienna (*q.v.*) when Napoleon made his daring escape, sent a huge force against him and caused his defeat at Waterloo (*q.v.*). The only course then open to Napoleon was a second and final abdication.

Hundred Years' War, the name of a long struggle between England and France, which went on intermittently from 1337 to 1453. Basically, it was caused by a conflict over the large fief in southern France, held by the English crown, the heritage of their French progenitor, Eleanor of Acquitaine. The English were determined to keep their inheritance, while the French were equally set on reuniting the lands which had slipped from their control. War was declared in 1337, when Edward III of England, a nephew of the French king, Charles IV, claimed the French crown. Two substantial victories were gained by the English—at Crécy in 1346 and at Poitiers in 1356. The Peace of Bretigny secured a short pause in the hostilities, which were resumed by Charles V and his successor, Charles VI, who reversed the French fortunes by almost completely driving the English out of French territory in 1380. For several decades peace reigned, but in 1415 the English under Henry V took advantage of a civil war in France and after their great victory at Agincourt (*q.v.*) captured nearly all of the French lands. Moreover, the Treaty of Troyes forced Charles VI to recognize Henry as regent of France and the heir to the French crown. The English success, however, was short-lived, for in 1429 the French, inspired by Joan of Arc (*q.v.*), were victorious on every hand. When the Hundred Years' War finally came to an end in 1453, the English held only the city of Calais, which was regained by the French in 1558.

Courtesy Ewing Galloway, N. Y.

SCENE ON THE PLAINS OF HUNGARY

Hungary (*hŭn'gä-rĭ*), a "People's Republic" of Europe, formerly the eastern part of the monarchy of Austria-Hungary. Following World War I, the area was 35,875 sq. m. The Vienna arbitration gave Hungary 4,605 sq. m. of Czechoslovakian territory in 1938 and, in 1939, 4,690 sq. m. were annexed from Slovakia. By the second Vienna award (1940), Germany and Italy gave to Hungary the northern portion of Transylvania, Rumanian territory, consisting of 16,642 sq. m.,

bringing the total area up to 61,812 sq. m. Before World War I, it included Croatia, Slavonia, and Transylvania. In 1946 the population of Hungary was estimated at 9,320,000 and that of Budapest is 1,026,883. The surface is well adapted to agriculture, which is the principal industry. It may be regarded as a natural basin around which extend mountain chains, except on the south, where the valley of the Danube stretches into Serbia. The Theiss, Danube, and Drave, with their tributaries, provide the drainage, practically all of which is by the Danube into the Black Sea. Two lakes, Balaton Lake and the Neusiedler Sea, are situated between the Drave and Danube, and form the principal lake basins. They have a depth of about 40 ft. and include extensive marshes, but the water evaporates from the latter in dry seasons.

The productions, climate, and general industries of Hungary are practically the same as those of Austria. Hungary is exceedingly rich in minerals, forests, and soil products. Railroad lines penetrate all portions of the country, the different lines including about 5,500 m. Among the minerals are iron, lead, copper, cobalt, salt, gold, silver, coal, petroleum, zinc, antimony, and peat. The country has large bauxite deposits, the production for one year amounting to about 500,000 tons. The soil products consist of wheat, cotton, tobacco, hay, barley, rye, a large variety of fruits, and many valuable forest products. Stock raising, dairying, and manufacturing are of growing importance. Schools and colleges are maintained under government grants, and school attendance is compulsory. Recent figures show that about 9.6 per cent of the population over six years of age are illiterate. The religious affiliations are diversified greatly, as also are the races represented in the various portions. Among the numerically strongest sects are the Roman Catholics, Lutherans, Calvinists, Greek Catholics, Arminians, Unitarians, and Israelites. The races most numerous are Magyars, Rumanians, Germans, Ruthenians, Serbs and Croats, Slovaks, and Jews. Hungarians constitute about one-half of the inhabitants. Budapest, the capital, Szeged, and Debreczen are thriving cities.

History. The Hungarians, or Magyars, are an Asiatic people of the Turanian race and are allied to the Finns and Turks. Formerly they occupied a large district in southern Russia adjacent to the Caspian Sea, but under their leader, Arpad, they crossed the Carpathians in 889 and established a foothold in the plain of the Danube. Subsequently they conquered the regions now occupied by Transylvania and Hungary and made incursions into Germany and France. Otho I of Germany defeated them so thoroughly that they became less warlike and began to develop agriculture and the arts. They established a kingdom in the latter part of the 10th century. In 997 Stephen I became their king, ruling until 1030. During his time the Hungarians embraced Christianity, established churches, founded cities and laid the foundation for their present power. Stephen was made a saint by Pope Sylvester II and was given the title of Apostolic King. During the reign of succeeding kings the boundary line was extended. Croatia and Slavonia were added in 1089 by King Ladislaus and Dalmatia was annexed in 1102 by King Coloman.

In 1222 the nobles secured from Andrew II the Golden Bull, the so-called Magna Charta of Hungary, which defined civil rights. Andrew III, the last of the House of Arpad, died in 1301, and was succeeded by Charles Robert of Anjou in 1309. During his reign Hungary became one of the greatest military powers of Central Europe. In 1342 Louis I became king. In his reign of 40 years he annexed Red Russia, Moldavia, Poland, and a part of Serbia. Sigismund, who ascended the throne in 1387, was elected Emperor of Germany. His reign became famous for the wars with the Turks and the Hussites. He established an academy at Buda and secured various reforms. Matthias Corvinus became king in 1458, founded a university at Pressburg, defended the country against the Turks, and added territory to his dominion. The next sovereign of note was Ladislaus II, who reigned from 1490 to 1516, and was succeeded by Louis II, reigning until 1526. While the last two sovereigns occupied the throne the country was disturbed by domestic troubles and incursions of the Turks. At Mohács the Hungarian army was defeated by Soliman the Great and 30,000 people were carried into slavery. A large portion of the Hungarian provinces remained under Turkish dominion for 160 years. Ferdinand of Austria, a brother-in-law of Louis II, subsequent to the death of the latter entered upon a conquest of Hungary. After a dispute between him and John Zápolya, of Transylvania, the Protestants sided with Ferdinand and the House of Hapsburg obtained control of Hungary. In 1687 Leopold I forced the Hungarians to declare the crown of Hungary forever hereditary in the House of Hapsburg.

Francis Rákoczy induced the Hungarians to rebel against Austria in 1703, but the effort proved futile. Charles VI succeeded in gaining the approval of the Hungarians by granting reforms and adopting the Pragmatic Sanction, under which Maria Theresa eventually became ruler. Both Germany and France disputed her claim, but the invaders were repelled by the Hungarians. The queen showed her gratitude by granting religious freedom, building schools, and encouraging agriculture. Joseph II, son of Maria Theresa, governed Hungary without regard for its constitution, but, when Francis I succeeded him, the

Courtesy Ewing Galloway, N. Y.

BUDAPEST, HUNGARY. CORONATION CHURCH

In this church, completed in the 15th century, Franz Joseph was crowned

Hungarians gave the latter valuable support in money and troops to defend the Hungarian constitution against the claims of Napoleon. Later he imposed exorbitant taxes, but in 1825 a diet was summoned to devise reforms, which discontinued the Latin language in public debates and adopted the Magyar. The diets of 1830 and 1832 again raised questions regarding absolute religious views, popular suffrage, and the rights of the common people. Such men as Francis Deák and Louis Kossuth were prominent supporters of these rights. These patriots were first imprisoned, but, when the French revolution of 1848 gained strength, it gave an impulse to the demands for greater rights and equality to the people of Hungary, and soon after many concessions were granted by the court of Vienna.

Kossuth published the first Hungarian daily newspaper and spread the doctrine of human rights over all the land, advocating equal taxes for all, freedom of speech and the press, and equality in citizenship. The government began to operate secretly against these demands, but the Austrians, who were also clamoring for reforms, encouraged a revolt of the Croats and Wallachians, inducing them to invade Hungary. An Austrian army sought to suppress the revolution, but after a number of battles the successes were on the side of the Hungarians, and Austria was obliged to enlist aid from the Russians. After struggling for some time the Hungarians were obliged to surrender, and many of the rebellious statesmen and soldiers were executed. After the Battle of Sadowa, in 1866, Hungary was granted a constitution. In 1867 Francis Joseph became King of Hungary and was succeeded, in 1916, by Charles I, who abdicated in 1918.

At the close of World War I it was deprived by the Paris Peace Congress of much territory, including Croatia, Slavonia and Transylvania, and the government was organized as a constitutional republic. In 1920, after the ousting of a Communist regime, the country declared itself a kingdom, but the throne was left vacant, with Nicholas von Horthy as appointed regent.

In the 1930's, Hungary, leaving the Italian camp, came more and more into the orbit of Germany (see earlier in this account for territorial gains made under the German aegis). During World War II, Hungary became a base for German military operations, and Hungarian troops relieved German forces by policing occupied countries, such as Yugoslavia. The country declared war on Russia June 27, 1941, on the U.S. and Great Britain, Dec. 13, 1941. Hungary fell to the Russian armies late in 1944, and a provisional government was established in Debreczen. This government was supervised by an Allied Control Commission, under the Russian High Command. Hungary concluded an armistice with the Allies and declared war on Germany in January 1945. In signing the armistice, Hungary agreed to re-

Courtesy Ewing Galloway, N. Y.

HUNGARIAN FOLK COSTUMES

The elaborate and colorful embroidery is an example of traditional Hungarian needlework

turn conquered territory to Czechoslovakia, Yugoslavia, and Rumania, and to keep within the limits of her frontiers of Dec. 31, 1937. According to the terms of the Hungarian peace treaty signed in Paris, Feb. 10, 1947, Hungary lost several towns south of the Danube to Czechoslovakia and part of Transylvania to Rumania. She was to pay reparations to Russia, Yugoslavia, and Czechoslovakia (see also *World War II*). On Feb. 1, 1946, the national assembly passed a bill making Hungary a republic and elected Zoltán Tildy the first president.

Economic disintegration of Hungary after the war was accelerated by severe demands from the Soviet Union, whose troops continued to occupy the country. In 1947 the Communist party gained the controlling influence in the government, and the purge of the opposition was increased thereafter. Church opposition to the nationalization of parochial schools and clerical property was also severely countered by the government. The conviction in 1949 of József Cardinal Mindszenty on charges of treason and black-market transactions was the most spectacular of a series of trials involving the clergy. Hungary's status as a Soviet satellite was exemplified by her joining (1949) the Council for Economic Mutual Assistance—the Kremlin counterpart of the E.R.P.—and her acceptance of a unified military command with other Communist nations in 1955. Nevertheless, Hungary was admitted to the U.N. in the same year. The unpopularity of the regime became evident in October-November 1956, when an uprising spread throughout the country. Crushed by Soviet troops, the revolt cost the lives of between 25,000 and 65,000 Hungarians. A special committee of the U.N. later characterized the event as "a spontaneous national uprising, due to long-standing grievances" and brought about in the hope of installing "democratic socialism." Imre Nagy, whose Communist sympathies had long been doubted, had been accepted by the people as a "symbolic figure," but his brief interim government was forced out by Soviet intervention. The Russian-installed regime of János Kádár ruthlessly suppressed the revolt, and thousands of Hungarians fled the country to seek refuge in the West.

Huns (*hünz*), a Turanian race of nomadic and warlike people who, before the Christian era, lived only in Asia. They had yellow complexions, low, strong body structure, flat noses, and eyes deeply sunken in the head. To prevent the growth of the beard, they scarred their faces with whips.

The Huns organized a powerful state in Mongolia. In the year 200 B.C. they overran the Chinese empire, but about the year 80 B.C. they were defeated by the Chinese, after which they migrated westward, settling at last between the Ural and Volga rivers. About A.D. 372 many Huns crossed the Volga, conquered the Alani and the Ostrogoths, and forced the Visigoths to migrate west and south of the Danube. Great waves of immigrants followed until the former lands of the Goths became a Hunnish stronghold. Their powerful chief Rugias, in 432, won valuable tributes from Emperor Theodosius II of Byzantium.

Their greatest warrior was Attila (*q.v.*), who called himself the "scourge of God." With an army of some 500,000, he moved westward from his Hungarian strongholds, vowing that he would not stop until he reached the sea. He defeated Theodosius in three battles and overran Macedonia, Thrace, and Greece. He later campaigned against the Germans on the Rhine and moved into France. At Châlons-sur-Marne, in 451, the Huns were defeated by Aëtius, the Roman general in Gaul, who thus saved Europe for Christianity and Western civilization. Attila next crossed the Alps into Italy, where he took city after city. While moving upon Rome itself, he was met by Pope Leo I, who, by his majestic mien and exemplary character, inspired Attila to spare the city. The death of Attila (453) and the defeat at Châlons-sur-Marne, followed by successive defeats by the Germanic tribes, thereafter kept the Huns east of the Danube. Their later activities, however, are not recorded in history.

Hunt (*hünt*), HELEN. See *Jackson, Helen Fiske.*

Hunt, JAMES HENRY LEIGH, poet and essayist, born in London, England, Oct. 19, 1784; died in Highgate, Aug., 28, 1859. After studying at Christ's Hospital, London (the same school at-

tended by Charles Lamb and Samuel Taylor Coleridge, *qq.v.*), in 1809, in partnership with his brother John, he founded the *Examiner*, a newspaper devoted to political liberalism. A libel suit (he had called the prince regent "a corpulent Adonis of fifty") brought him a heavy fine and two years of imprisonment. During his confinement, he was visited by other literary men, including Byron, Keats, and Shelley. Hunt's numerous poems and essays are characterized by a light fancy and unfailing cheerfulness about the cosmos and his fellow men. His extended visit to Italy (1822-25) gave him new literary insights, which had a considerable influence upon other writers of his period. His best-known works include "Lord Byron and His Contemporaries" (1828), "Imagination and Fancy" (1844), "Men, Women, and Books" (1847), "The Story of Rimini" (a poem, 1816), and "Autobiography" (1850). He wrote lives of Congreve and Farquhar and sketches of Shelley and Keats.

Hunt, RICHARD MORRIS, architect, born in Brattleboro, Vt., Oct. 31, 1828; died July 31, 1895; brother of William Morris Hunt (*q.v.*). He studied architecture in Geneva, Switzerland, and in Paris, France, and traveled extensively in Africa and Asia. In 1855 he returned to the U.S., and later designed many fine residences in Newport, Boston, and New York. Among his principal buildings are the Lenox Library, the Naval Observatory at Washington, the Divinity Coll. building at Yale, the old *Tribune* building in New York, the country home of George Vanderbuilt at Biltmore, N.C., the Administration building at the Columbian Exposition in Chicago, and the extension of the National Capitol in Washington. He was one of the founders of the American Inst. of Architects and was made a chevalier of the Legion of Honor.

Hunt, WILLIAM HOLMAN, painter, born in London, England, in April 1827; died there, Sept. 7, 1910. After study at the Royal Acad., in 1846 he was admitted to membership. In 1848 he became associated with Dante Gabriel Rossetti. The two were joined by several other young painters in establishing the Pre-Raphaelite Brotherhood, a movement designed to avoid vivid and excessive imaginative treatment of subjects, aiming to secure greater trueness to nature. He visited Palestine in 1854 for the purpose of studying life in the East, and while there executed a series of pictures illustrating incidents in Bible history. Hunt produced many fine works of art. They include: "The Flight of Madeline and Porphyro," "Light of the World," "The Scapegoat," "Triumph of the Innocents," "Finding of the Savior in the Temple," "The Flight into Egypt," and "Dante Gabriel Rossetti."

Hunt, WILLIAM MORRIS, painter, born in Brattleboro, Vt., March 31, 1824; died in the Isles of Shoals, N.H., Sept. 8, 1879; brother of Richard Morris Hunt (*q.v.*). He attended Harvard Coll. and studied art in Düsseldorf, Germany. Hunt later studied painting in Paris, where he became a friend of Millet, with whom he painted in the forests of Fontainebleau. In 1855 he returned to the U.S. and settled at Newport, R.I., but subsequently removed to Boston, where he worked and taught as an artist. He exercised considerable influence upon art in the U.S. and produced a number of works that are praised for their coloring and artistic qualities. They include: "The Flight of Night," "The Prodigal Son," "Newton Lower Falls," "Dead in the Snow," "Girl with the Kitten," "Peasant Girl at Barbizon," and "The Farmers' Return."

Hunter (*hŭn'tĕr*), DAVID, soldier, born in Washington, D.C., July 21, 1802; died there Feb. 2, 1886. In 1822 he was graduated from West Point, became captain of dragoons in 1833, and twice crossed the Rocky Mts. while on frontier duty. In the Mexican War he was paymaster in the command of Gen. Wood, and in 1861 accompanied Lincoln while he was proceeding to Washington to be inaugurated. Shortly after, he entered the Union army, commanded a division at Bull Run, and the following year became major general of volunteers. About this time he organized a volunteer regiment of fugitive slaves, one of the first Negro groups in the national service, an act which induced Jefferson Davis to proclaim him an outlaw. In 1864 he commanded the department of West Virginia, defeated a Confederate force at Piedmont, and subsequently served on the commission which tried the conspirators implicated in the assassination of Lincoln.

Hunter, JOHN, surgeon and physiologist, born in Glasgow, Scotland, Feb. 13, 1728; died in London, England, Oct. 16, 1793. Educated in the common schools, he was apprenticed to a cabinetmaker, then studied medicine and surgery at St. Bartholomew's Hospital. He later studied at Oxford and in 1761 joined the army as staff surgeon. In 1763 he began to practice surgery in London, where he became noted as a successful anatomist and one of the fathers of zoological science. He was also famous for his wound surgery and wrote "A Treatise on the Blood, Inflammation, and Gunshot Wounds." His anatomical collection was purchased by the British government and presented to the Royal Coll. of Surgeons. Among his books are a treatise on venereal disease, "Observations on Certain Parts of the Animal Anatomy," and "Natural History of the Human Teeth."

Hunter, ROBERT MERCER TALIAFERRO, politician, born in Essex County, Virginia, April 21, 1809; died at his home near Lloyds, Va., July 18, 1887. Hunter was graduated from the Univ. of Virginia and studied law. In 1830 he began

a successful practice. In 1833 he was elected to the Virginia legislature and three years later became a Whig member of the U.S. Congress. He became Speaker of the House in 1839 and in 1847 a member of the U.S. Senate, where he was prominent as an advocate of states' rights. In 1861, one month before the secession of Virginia, he withdrew from the U.S. Senate and was Secretary of State in the Confederate cabinet from 1861 to 1862. He was chosen a senator of the Confederate States in 1862, serving throughout the war, and in 1874-80 he was treasurer of the State of Virginia. In the Confederate Congress he was an opponent of the policy of Jefferson Davis and in 1865 took part in the Hampton Roads conference (*q.v.*).

Hunter College of the City of New York, founded in 1870 at its present site, Park Ave. and 68th St., as a "Normal and High School for females." Today it also has a unit on the Jerome

HUNTER COLLEGE

Park Reservoir site in the Bronx. It is an institution of higher learning granting the bachelor's and master's degrees to qualified students who are *bona fide* residents of New York City. See also *New York, City University of.*

Hunting (*hŭnt'ĭng*). See *Game.*

Huntingdon (*hŭn'tĭng-dŭn*), a city in south central Pennsylvania, seat of Huntingdon County, on the Juniata River, 20 m. w. of Altoona. It is served by the Pennsylvania R.R. Blair County Airport is *ca.* 27 m. w. of the city. The surrounding area produces livestock and dairy products and has deposits of coal, glass, and sand. The manufactures include fiberglas, highway equipment, and paper tablets. It is the seat of Juniata Coll. Huntingdon was settled in 1767 and incorporated in 1796. Population, 1940, 7,170; in 1950, 7,330; in 1960, 7,234.

Huntington (*hŭn'tĭng-tŭn*), a city in northeastern Indiana, seat of Huntington County, on the Little Wabash River, 25 m. s.w. of Ft. Wayne. It is served by the Erie and the Wabash R.R.'s, and by Baer Field, 9 m. s.w. of Ft. Wayne. An industrial community, it manufactures electronics, cranes, shovels, and automotive, heating, and air-conditioning equipment. The surrounding region is chiefly agricultural. Huntington was settled in 1831, incorporated as a town in 1848 and as a city in 1873. Population, 1940, 13,903; in 1950, 15,079; in 1960, 16,185.

Huntington, a town in Suffolk County, New York, on Long Island Sound, 36 m. E. of New York City. It is served by the Long Island R.R. The center of Huntington Township, which includes some 15 communities, Huntington is primarily commercial and residential, although it has a rapidly growing electronics industry. The surrounding area produces truck crops, poultry, and dairy products. Points of interest include the Nathan Hale Rock, in Halesite, where Nathan Hale (*q.v.*) landed from Connecticut in 1776, and the birthplace of Walt Whitman (*q.v.*). Huntington was settled in 1653. Population, 1960, 11,255.

Huntington, a city in western West Virginia, seat of Cabell County, on the Ohio River, 52 m. w. of Charleston. It is served by the Chesapeake and Ohio and other railroads. Tri-State Airport is 11 m. w. of the city. In an area rich with coal, natural gas, and petroleum, Huntington is an industrial center, its manufactures including railroad cars and rails, nickel and glass products, chemicals, steel, and apparel. It is part of the Huntington-Ashland, W. Va.-Kentucky-Ohio Standard Metropolitan Statistical Area (West Virginia portion pop., 1960, 147,149; value added by manufacture, 1958, $113,764,000), including Cabell and Wayne counties in West Virginia. Huntington is the seat of Marshall Coll. The area was settled in 1796; the city was chartered in 1871 when it became the terminus for the Chesapeake and Ohio Ry. Population, 1940, 78,836; in 1960, 83,627.

Huntington, DANIEL, painter, born in New York City, Oct. 14, 1816; died Apr. 18, 1906. He studied at the National Acad. of Design under Prof. S.F.B. Morse and in 1839 at Florence, Italy, where he produced a number of excellent pictures. He served as president of the National Acad.

most of the time from 1862 to 1891. Huntington tried his hand at all types of painting, from conventional dull-colored portraits to genre subjects and works like "Mercy's Dream," a sugary allegory which pleased the popular taste of the time.

Huntington, HENRY EDWARDS, financier, born in Oneonta, N.Y., Feb. 27, 1850; died in Philadelphia, Pa., May 23, 1927. A business associate and nephew of the railroad magnate COLLIS POTTER HUNTINGTON (1821-1900), he aided in the development of transportation systems and real estate in southern California. His estate at San Marino, Calif., containing art collections, botanical gardens, and a valuable library, was established as a public trust at his death.

Huntsville (*hŭnts'vĭl*), county seat of Madison County, Alabama, 90 m. N. of Birmingham. It is on the Southern and other railroads and is the business center of a mixed farming area. Nearby are Monte Sano State Park, topped by a 1,650-ft. peak, and the Alabama Agricultural and Mechanical Coll. at Normal. Once known as Twickenham, Huntsville was settled about 1800. The first capital of Alabama, Huntsville was the site of the state constitutional convention in 1819. Population, 1950, 16,437.

Huntsville, county seat of Walker County, Texas, 71 m. N. of Houston, on the Missouri-Pacific R.R. The center of a stock-raising region, it produces cotton goods, dairy products, and lumber. The state penitentiary, Sam Houston State Teachers Coll., and Sam Houston Park are located here. Population, 1950, 9,820.

Hunyadi (*hōō'nyō-dĭ*) or HUNYADY, JÁNOS, military leader, born in Hunyad, Transylvania *ca.* 1385; died in Zemun, Hungary (now part of Yugoslavia), Aug. 11, 1456. One of Hungary's national heroes, he led his countrymen against the crushing advance of the Turks into the Balkans during the early 15th century. He first saw military service under Emperor Sigismund (1410-37) and his successor Albert of Austria (1437-39), who fell in battle. Hunyadi then commanded the forces of the newly-elected king, Vladyslav I, but met with a disastrous defeat at Varna (1444), where the king himself was slain. Thenceforth, Hunyadi, who was made regent (1446) for young Ladislas V, was virtual ruler of Hungary. In 1456 he won a decisive victory against Sultan Mahomet II at Belgrade, but shortly afterward he died of the plague. His son, Matthias Corvinus, became king of Hungary in 1458, upon the death of Ladislas.

Hupeh (*hōō'pā*) or HUPEI, a province in central China, watered by the Yangtze and Han rivers, which meet at Hankow, Hanyang, and Wuchang, the capital; area, *ca.* 71,900 sq. m. These cities, located in close proximity and known as the three Han Cities, form one of China's major commercial and transportation hubs. The iron mines at Tayeh are among the most valuable in China. Primarily an agricultural region, Hupei produces wheat, barley, cotton, tea, and rice. Population, 1952, 21,470,000.

Hurdle Race (*hûr'dl rās*) or HURDLING, a running race over a short distance, in which the contestants surmount a series of fencelike obstacles, or hurdles, set at equal distances apart on the track. At the 1952 Olympics held at Helsinki, Finland, the following hurdling records were made: 110 meters in 13.7 seconds, Harrison Dillard, U.S.; 400 meters in 50.8 seconds, Charles Moore, Jr., U.S.

Hurdy-Gurdy (*hûr'dĭ gûr'dĭ*), a musical instrument originating in France and popular during the 13th and 14th centuries. It was lutelike in shape and consisted of strings stretched across

Courtesy Metropolitan Museum of Art, N. Y.
HURDY-GURDY
French, 18th century

a sounding board and made to vibrate by a wooden wheel turned by a crank. The instrument was never recognized by serious musicians, and by the 18th century it had run the course of its popularity. Thereafter, it became the instrument of beggars and peddlers. Today, the term is used for any type of hand or grinding organ which is played by turning a crank.

Hurley (*hûr'lē*), PATRICK JAY, lawyer and diplomat, born in Choctaw Indian Territory (now Oklahoma), Jan. 8, 1883. A graduate of the National Univ. Law School (Washington, D.C.) in 1908, he practiced law in Tulsa, Okla., and fought overseas as a colonel in the U.S. Army in World War I. Returning to his law practice, he became active in Republican party politics, served as Secretary of War in the cabinet of President Herbert Hoover (1929-33), and then remained in Washington as a corporation lawyer. During World War II he went on numerous diplomatic missions. Hurley was minister to New Zealand (1942-43) and ambassador to China (1944-45), he became a major general, 1944; and in 1952 ran unsuccessfully for U.S. Senator from New Mexico.

Huron (*hū'rŭn*), county seat of Beadle County, South Dakota, 120 m. E. of Pierre, on the Great Northern and the Chicago & North Western R.R.'s. It is located in an agricultural area

and processes the farm products. It is the seat of Huron Coll. Huron was founded in 1879 and incorporated in 1883. Population, 1950, 12,788.

Huron Indians, a tribe of North American Indians, which formerly occupied the lake region of Ontario. They were classed with the Huron-Iroquois family. Among the Indians they were generally spoken of as the Wyandottes and they have been known by that name since 1751, but they were designated as Hurons throughout the early colonial times. They were frequently at war with the more powerful Iroquois, for which purpose they became allied with the Algonquins at different periods, but by the middle of the 17th century were driven westward to the vicinity of Lake Superior. In 1632 the Jesuits started missions among them, and by 1670 they had caused most of the tribe to settle in the vicinity of Mackinaw. The operations of these missionaries induced many to embrace the Catholic religion and to learn the French language. Subsequently some of them drifted into territory which is now occupied by the U.S. In the War of 1812 they aided the British and in 1832 a reservation was formed on the present site of Kansas City, Kan., which was known as the Wyandotte. Subsequently the larger part of the tribe was settled on the Quapaw reservation, where it numbers about 300. The Hurons remaining in Ontario, Canada, occupy a region near Quebec, where they have been intermixed largely with the French. Many have adopted civilized arts and habits of life.

Huron, LAKE, one of the five Great Lakes of North America, located between the State of Michigan on the west and the Province of Ontario on the east and south. It joins Lakes Superior and Michigan on the north and Lake Erie on the south. The length is 256 m., the width, 190 m.; and the area, 22,322 sq. m. It is from 200 to 700 ft. deep and its surface is 582 ft. above the sea. Within the lake are about 3,000 islands, of which Grand Manitoulin is the largest. The major bays are Saginaw and Thunder on the west and Georgian on the east. The water is pure and clear. Many valuable species of fish abound. Good harbors are plentiful, including those at Bay City, Port Huron, and Cheboygan, Mich.; and Collingwood, Kincardine, and Goderich, Ontario. The most important streams flowing into it include the Saginaw and Au Sable Rivers. Lake Huron receives the discharge from Lake Superior through the St. Mary's River, and is connected with Lake Michigan by the Strait of Mackinaw. It discharges into Lake Erie through the St. Clair River, Lake St. Clair, and the Detroit River.

Hurricane (*hŭr'rĭ-kăn*). See *Storms; Whirlwind.*

Hurst (*hûrst*), FANNIE (MRS. JACQUES S. DANIELSON), novelist, born at St. Louis, Mo., Oct. 19, 1889. She was educated at the Univ. of Washington, and took up a literary career. To obtain materials for novels, she made special studies of shops and domestic life and visited Russia and other countries of Europe. Among her writings are: "Song of Life," "A President Is Born," "Mannequin" (won a $50,000 prize), "The Vertical City," "Humoresque" (dramatized), "Lummox," "Imitation of Life," and "Lonely Parade."

Hurst, JOHN FLETCHER, bishop, born near Salem, Md., Aug. 17, 1834; died May 4, 1903. The Methodist conference at Cincinnati in 1880 elected him bishop. He was made chancellor of the American Univ. at Washington, D.C., in 1891. His publications include: "History of the Christian Church," "History of Rationalism," "History of the Reformation," and "The Country and People of India and Ceylon."

Husband and Wife (*hŭz'bănd, wīf*), the two parties to a marriage contract, after the same has been suitably ratified through solemnization by a minister or a civil officer empowered to perform that act. The laws which govern the marital relation are among the most important of those which prevail in any community. Though they have been looked upon in this respect from remote antiquity, many marked changes have taken place within the last two centuries in the legal relations existing between husband and wife. The common law of England formerly regarded the person of the wife as merged in that of the husband, and all of her property rights were transferred to him at the time of marriage. This law did not give to woman that place and those rights which place her on an equality with the husband, and since then many changes have taken place in the equity of England as well as in the statute law of America. At present the marriage relations between husband and wife may be said to be those of practical equity, and they are governed by the laws enacted in the state or province. Since equity and statute law differ somewhat in the various states and as there is no national law governing marriage relations, it is impossible to give more than a general outline of the more important common law rules in the scope of this article.

Since the residence of the husband is that of the wife, it being her duty to reside with him, the husband has the right to determine the residence of the family. He is required to support the wife according to his ability and income, and she is obligated to render reasonable and necessary domestic service. In some states the husband is liable for debts contracted by the wife before marriage, but generally neither husband nor wife is liable for the debts or liabilities of the other incurred before marriage. At common law, when a man married a woman, he became liable for all the debts she owed when married, but she was not competent in law to


Alpine Type—Caucasoid Race

Nordic Type—Caucasoid Race

contract a debt in her own name after marriage. At present she may purchase necessaries for the home, such as clothing, articles of food, and essentials in furthering the reasonable educational advancement of the family.

Previous to a marriage the parties may make agreements between themselves about their separate properties, and, if these are not unreasonable or against the policy of the law, they will be enforced after marriage. In the absence of such a contract, neither the husband nor wife can dispose of real property without the consent of the other, since the right of dower is attained at the time of marriage in the absence of a contract. Under the common law neither the husband nor wife could sue the other, except for separation or divorce, but now the law of most countries permits either party to sue for the recovery of property or in equity for other rights. However, neither is a competent witness against the other, except in actions at law where one of the parties sues for protection against the other. The presumption of the husband's influence over the wife still exists to the extent that if she commits a crime in his presence, she is punishable for it if it is shown that she did it of her own free will. While married women have been emancipated from many of the disabilities imposed upon them by the common law, the modern statutes and courts still recognize the husband as the head of the family, although husband and wife are considered separate entities.

Huss (*hŭs*), or HUS, JOHN, religious reformer, born in Hussinecz, Bohemia, *ca.* 1370; suffered martyrdom, July 6, 1415. Following studies in his native town, he entered the Univ. of Prague, receiving a degree in 1393. He began to lecture at that university on theology and philosophy in 1398, becoming dean of the philosophical faculty in 1401 and rector in 1402. Influenced by the writings of Wycliffe (*q.v.*), whom he had begun to study as early as 1391, he vigorously denounced auricular confession, ecclesiastical greed, papal indulgences, and masses for the dead. Huss' preachings, based essentially on the teachings of Wycliffe, although, by 1403, it had been generally forbidden to spread the ideas of Wycliffe, were a source of great embarrassment to the clergy, particularly since Huss found a tremendous audience among the people and even influenced the king. Huss became father confessor to the queen, and was several times given the office of preacher of the synod by the archbishop. The archbishop further ordered Huss to examine certain alleged miraculous healings, with the result that pilgrimages were forbidden and the miracles declared forgeries.

Thus it is easy to understand that Huss' general skeptical attitude against the church and the influence of his preaching made him greatly hated

MARTYRDOM OF JOHN HUSS

by the higher clergy. Huss persuaded the German magisters and students to emigrate from the Univ. of Prague to the Univ. of Leipzig. Huss was deprived of the right to exercise priestly functions following complaints against him by the clergy in 1408, and finally, in 1410, the same Archbishop Sbynko, who only a few years before, had favored Huss, disagreed with his teachings, and excommunicated him and burned 200 volumes of the writings of Wycliffe. A trial in Rome was instigated by Sbynko, and while it lasted (1412), Huss vehemently opposed a bull of indulgence published by Pope John XXIII, and when the Pope summoned him to appear in Rome, Huss refused to comply. He continued his opposition against the practices of the church, writing and lecturing with great boldness. He was supported by the royal family and the people of Prague who had prevented his excommunication.

It should be pointed out that, although Huss fought against certain abuses of the church, he agreed with almost all of the church doctrines and recognized fully the authority of the councils of the church.

When he was again indicted in 1413, Huss appealed to a general council and in a book entitled "On the Church," he condemned papal abuses and denied the unconditional supremacy of the pontiff. The nobles and the common people gave him vigorous support, and he was pro-

vided with "safe conduct" by Emperor Sigismund, while attending the general council at Constance.

Despite protests from the Polish and Bohemian nobles, Huss was imprisoned shortly after his arrival in Constance (Nov. 3, 1413). A formal trial on alleged grounds of heresy was instituted on June 5, 1415, and the following July 6, 39 charges were brought against Huss. He denied some of them, but admitted others. He was hindered in his defense because the same council, a month earlier, had condemned the teachings of Wycliffe. Unable, therefore, to refer to the teachings of Wycliffe, and refusing to recant alleged errors, he was condemned to be burned at the stake. He suffered martyrdom the same day, and his ashes were consigned to the Rhine.

The life of Huss stands as one of the noble examples of devotion to freedom in religious thought. His writings, although taken up primarily with the discussion of questions pertaining to church and state, had a lasting influence on the life and literature of Bohemia. More than that, Huss may be definitely considered a predecessor of the later reformers, such as Luther and Zwingli. It was Huss' tragic fate to be born a century too early, when the general spiritual conditions were not yet ripe for criticism of the Catholic Church.

Husserl (*hōōs'ĕrl*), EDMUND (1859-1938), a German philosopher, considered the founder of phenomenology (*q.v.*).

Hussites (*hŭs'ĭts*), a powerful organization that honored John Huss and Jerome of Prague (*qq.v.*) as martyrs, and after the death of the former took up arms in defense of their religious principles. Under the leadership of Johann Ziska they captured Prague and successfully opposed Emperor Sigismund, whom they charged with breaking his pledge in furnishing safe conduct to Huss. There were two parties among the Hussites, known as the Calixtines and Taborites. The former comprised the so-called moderate Hussites, who, later, by the compact of Prague, in 1433, united with the Catholics. During the union of both branches the priests and monks were punished excessively, but when they became separated a weakness appeared and the Taborites were defeated in a battle at Bömischbrod on May 31, 1434. Subsequently their political influence declined and for religious purposes they became united with the Bohemian Brethren.

Hutcheson (*hŭch'ē-sŭn*), WILLIAM L., labor leader, born in Saginaw County, Michigan, Feb. 7, 1874; died in Indianapolis, Ind., Oct. 20, 1953. He began working as a carpenter in 1890 and joined the United Brotherhood of Carpenters and Joiners. He advanced gradually through administrative posts until he became general president of the union in 1915. He became a first vice president of the A. F. of L. in 1940. He was in charge of the labor division of the National Republican party in the 1932 and 1936 Presidential campaigns and was himself a candidate for the Republican Vice Presidential nomination in 1944. Hutcheson, who continuously opposed the principle of industrial unionism, was known as a strong-willed leader of his union; he used his powers freely to bring the rank and file into agreement with his policies.

Hutchins (*hŭch'ĭnz*), ROBERT MAYNARD, educator and administrator, born in Brooklyn, N.Y., Jan. 17, 1899. He attended Oberlin Coll. and took his law degree (1925) at Yale Univ., where

ROBERT MAYNARD HUTCHINS

he later served on the faculty and as acting dean. In 1929 he was elected president of the Univ. of Chicago, and from 1945 to 1951 he was chancellor of that institution. He also served as a director of the "Encyclopaedia Britannica" after it was acquired by the university. In 1946 he took a one-year leave to promote the "great books" adult-education program. While at the university, Hutchins put into effect a strong liberal arts (*q.v.*) program with much of the responsibility for education placed on the student through the student's contact with the great books of the world. In 1951 Hutchins became an associate director of the Ford Foundation, and in 1954 he became president of the Fund for the Republic, a Ford philanthropy that has made important studies in what makes a free society and how to preserve it. Hutchins has written a number of books, including "The Higher Learning in America" (1936), "Education for Freedom" (1943), and "Some Observations on American Education" (1956). He is the editor of "Great Books of the Western World" (54 vols., 1952).

Hutchinson (*hŭch'ĭn-sŭn*), county seat of Reno County, Kan., on the Arkansas River, 225 m. s.w. of Kansas City, on the Missouri Pacific,

the Chicago, Rock Island & Pacific, and the Santa Fe R.R.'s. There are rich deposits of salt and oil in the vicinity. In addition to three salt evaporating plants, there are manufactures of metal furniture, agricultural implements, candy, canned foods, flour, and wall boards. It was founded in 1871 and incorporated in 1874. Population, 1940, 30,013; in 1950, 33,575.

Hutchinson, ANNE, religious enthusiast, born in Alford, England, in 1591; died near New Amsterdam (now New York City) in August 1643. She and her husband came to America in 1634, settling in Boston, Mass. Her peculiar religious views and severe denunciation of the Massachusetts clergy in public lectures caused her to be tried for heresy and banished from Massachusetts. Shortly after, she bought the island of Aquidneck from the Narragansett Indians and founded Portsmouth. Her husband died in 1642, when she settled in Connecticut, and the following year she and her family were massacred by the Indians.

Hutchinson, THOMAS, royal governor of Massachusetts, born at Boston, Mass., Sept. 9, 1711; died June 3, 1780. He attended Harvard Coll., studied law, and established a successful practice at Boston. After serving a term of years in the General Assembly, he was made lieutenant governor, became chief justice, and in 1771 was commissioned governor of Massachusetts. He was unpopular among those who advocated independence, since he supported all the measures of the British ministry with unswerving loyalty. The Americans made two attacks upon his house during the Stamp Act riots of 1765, in the last of which much of his furniture and many books were lost or destroyed. In 1774, wearied with the conflict during the stormy times preceding the Revolution, he sailed to England, where he was granted a pension for his service to the crown. He was an accomplished scholar and historian.

ULRICH VON HUTTEN

Hutten (*hōōt'ĕn*), ULRICH VON, poet, reformer and humanist, born at Steckelburg, near Fulda, Prussia, Apr. 21, 1488; died at Ufenau, Lake Zurich, Aug. 23, 1523. He was educated in the humanities, devoted himself to poetry, took part in the revolutionary movements of his time, including those of the Church. Although he strongly attacked the Church and the clergy, favoring Martin Luther's reforms, his participation in the Peasants' War was nonetheless motivated by political rather than religious interests. He strove for the political freedom of his fatherland.

Huxley (*hŭks'lĭ*), ALDOUS LEONARD, novelist and critic, born in England in 1894, grandson of Thomas Huxley (*q.v.*) and brother of Julian S. Huxley (*q.v.*). After formal education at Oxford Univ., he took up journalism, contributing articles to the *Athenaeum* (1919-20), and to the *Westminster Gazette* (1921). Among his many works are: "The Burning World" (1916), "Limbo" (1920), "Chrome Yellow" (1921), "Antic Hay" (1923), "Point Counter Point" (1928), "Brave New World" (1932), "Eyeless in Gaza" (1936), "After Many a Summer Dies the Swan" (1939), "The Art of Seeing" (1942), "Time Must Have a Stop" (1944), and "Ape and Essence" (1948).

An expert stylist, Huxley is also a master of satire. He is considered one of the very few modern novelists who combine a special gift of story-telling with a discussion of philosophical ideas. In his later works, he has turned more and more toward mystical concepts. Huxley's books of the last decade have had one definite tendency: The principal characters lose a subtle skepticism, gaining a mystical belief in metaphysical values. These values are partly early Christian concepts, influenced by Buddhism and Oriental theosophy (*q.v.*). Huxley's mysticism does not exclude wit, however, and his ironical treatment of various aspects of modern life often approaches caricature.

Huxley is important because of his psychological grasp of typically modern problems. The main value of his novels lies in the dialogue and the ideas expressed therein, while his plots are of minor importance. The social sphere depicted is the English upper middle class and a mingling of intellectuals and foreigners of the same social standing—the layer of society in which the spiritual development of the last two decades is generally thought to have occurred.

The discussions in Huxley's novels reflect the

ALDOUS HUXLEY *Courtesy Brown Bros., N. Y.*

trends of his time, the influence of divergent philosophies, spiritual movements, political fashions, and so forth. As Huxley believes that spiritual progress is typical of modern man, his characters show the constant changes thinking persons undergo in their lives.

Huxley, JULIAN SORELL, biologist and writer, born in London, England, in 1887, son of Leonard Huxley and brother of Aldous Huxley (*q.v.*). Educated at Oxford Univ., he went to America as assistant professor of zoology at Rice Inst., Houston, Tex. (1913-16), then returned as staff member to Oxford Univ. (1919-25), where he was appointed professor (1925-27); for several years thereafter, he was lecturer at King's Coll., London, and delivered the Fuller Lectures at the Royal Inst. (1926-29). From 1935-42 he was secretary of the London Zoological Society.

JULIAN HUXLEY *Courtesy French Information Service, N. Y.*

A noted scientist and writer, conveying in his writings a complete perspective of life, his best known works include: "The Individual in the Animal Kingdom" (1911), "Essays of a Biologist" (1923), "The Stream of Life" (1926), "What Dare I Think" (1930), "At the Zoo" (1936), "The Living Thoughts of Darwin" (1939), "The New Systematics" (1940), "Evolution Restated" (1940), "Evolution: The Modern Synthesis" (1942), and "On Living in a Revolution" (1943).

The influence of his writings goes far beyond scientific circles. A whole school of popular writers is indebted to his research. In 1946 he was named director general of the United Nations Scientific and Cultural Organization.

Huxley, LEONARD, editor, author, born in England in 1860; died in 1933. He first entered the teaching profession, instructing at Charterhouse School (1884-1901). He then became editor of *Cornhill Magazine,* and edited such publications as "Jane Welsh Carlyle: Letters to Her Family" (1924), and "Letters to Her Sister, from Elizabeth Barrett Browning" (1929). His original works include "Life of Huxley" (1900), "Charles Darwin" (1921), and "Anniversaries and other Poems" (1920).

Huxley, THOMAS HENRY, English biologist and evolutionist, born in Ealing, England, May 4, 1825; died June 29, 1895; grandfather of the biologist Julian Huxley and of the novelist Aldous Huxley. Thomas Huxley received little early education, but by his own initiative became a surgeon on the ship *Rattlesnake.* He devoted every spare moment to studying marine organisms and at once began a series of important contributions to biology, particularly anatomy. With the publication (1859) of Darwin's evolutionary theory, Huxley at once realized that this theory gave meaning and importance to comparative anatomy, which hitherto, aside from purely medical aspects, had been static and sterile. He became an active and vigorous proponent of evolution, his flair for argument and debate winning for him the title of "Darwin's bulldog." He became an agnostic and a proponent of what was essentially a scientific modification of the skeptical philosophy of Berkeley (*q.v.*) and Hume (*q.v.*). At the same time, he strove to improve society through wider application of the scientific spirit and adoption of a code of ethics based on common sense and a primarily biological analysis of man's nature.

Today, with the battle for evolution largely won, Huxley is remembered chiefly among biologists for his many important contributions to comparative anatomy. As a result of his early studies of jellyfish and other simple animals on the *Rattlesnake,* he stated that animals are composed basically of two layers of cells, an ectoderm and an entoderm, to which a third, the mesoderm, is added in more complicated animals. This con-

Courtesy Brown Bros., N. Y.

THOMAS H. HUXLEY

Official Netherlands Photo

CHRISTIAN HUYGENS

cept has been of the greatest value in embryology and anatomy, as it furnishes a basis for analyzing the development of all animals.

Huxley also published many treatises on vertebrate animals and a handbook on their anatomy. A large amount of this work consisted of descriptions of new species of fossil fishes, dinosaurs, and some interesting primitive amphibians from the fossil beds of England. He made an important study of the evolution of the skull in higher animals. Turning his attention to birds, he found that they are no more than "glorified reptiles" and proposed a category, *Sauropsida,* to contain both birds and reptiles. He studied the puzzling problem of the classification of birds and eliminated confusion by setting up four major classifications (still accepted by scientists) which he based on the arrangement and structure of the bones of the palate.

Huygens (*hī′gĕnz*), CHRISTIAN, mathematician, physicist, astronomer, born at The Hague, Holland, in 1629; died in 1695; son of Constantijn Huygens, Dutch poet and diplomat; studied at Leyden. After improving the telescope, he discovered Saturn's rings and its fourth satellite (1655). A year later he invented the telescopic micrometer, of great importance to astronomy, and was the first to regulate clock movement by a pendulum. Developing Galileo's researches in motion and gravity, he was able to predict the acceleration caused by gravity. In 1669, he announced laws governing collision of elastic bodies. His work on the theory of light was of particular significance. He enunciated the wave theory (1678), which held that light moves in passing through a given medium. By 1690 he could prove the soundness of his theory in application to reflection, refraction, and double refraction. He is also credited with first observing polarization. Made a fellow of the Royal Society (1653), he worked in Paris (1666-81) under the sponsorship of Louis XIV. His major works were *"Horologium oscillatorium"* (The Pendulum Clock, 1673); and *"Traité de la lumière* (Treatise on Light, 1690).

Huysmans (*hois′mäns*), JORIS KARL (christened CHARLES MARIE GEORGES), novelist, born in Paris, France, Feb. 5, 1848; died there, May 12, 1907. Descended from a Flemish family which had produced several painters, he pursued his literary activities while holding a position in the French ministry of the interior. Influenced by Baudelaire, Zola, Flaubert, and the de Goncourt brothers, he at first presented in his books a naturalistic picture of everyday life. Later he became interested in glorifying aesthetics and then, after his conversion to Catholicism, he wrote on religious themes. Some of his best-known works are *"Marthe, histoire d'une fille"* (1876), *"Là bas"* (Down There, 1891), *"En route!"* (1895), and *"La cathédrale"* (1898).

Hwang Ho (*hwäng′ hō*). See *Yellow River.*

Hyacinth (*hī′ȧ-sĭnth*), a genus of flowering plants which belong to the order of *Liliaceae.* It includes many species, several of which are highly popular as garden flowers, especially the bluebell hyacinth. Dutch traders first brought the hyacinth to Europe from its nativity in the Levant in the early part of the 16th century. Since then it has been greatly improved by cultivation and bears many kinds of

BLUEBELL HYACINTH

beautiful flowers of various colors. The bulb is stout and onionlike, the leaves are fleshy and linear, the stamens are six in number, the style is single, and the seeds are numerous. At Haarlem, Holland, are the most extensive bulb gardens in the world, where the finest double-flowering species have been originated. In early times it was cultivated in Asia Minor and as far east as Persia, where it is still a favorite flower. Many beautiful romances and other literary works mention the Oriental hyacinth, and it has entered even more widely into the modern literature of all countries.

Hyacinthe (*ē-à-sănt'*), PÈRE. See *Loyson*.

Hyaloplasm (*hī'à-lô-plăz'm*). See *Protoplasm*.

Hyatt (*hī'ăt*), ALPHEUS, naturalist, born in Washington, D.C., Apr. 5, 1838; died Jan 15, 1902. After studying at the Maryland Military Acad., he graduated from the Lawrence Scientific School, and in 1862 entered the Union army, attaining the rank of captain. In 1867 he became curator of the Essex Inst., and in 1870 was appointed professor of zoology and paleontology at the Mass. Inst. of Technology. He aided in founding the marine biological laboratories at Woods Hole and Annisquam, was honored by membership and official positions in scientific societies, including the National Acad. of Sciences, and was one of the founders and editors of the *American Naturalist*. His principal work is a classification of fossils, concerning which he brought out many theories in regard to the evolution of Cephalopoda. His books include "Genera of Fossil Cephalopoda," "Observations on Freshwater Polyzoa," "Larval Theory of the Origin of Cellular Tissue," and "The Genesis of the Arietidae."

Hybrid (*hī'brĭd*), an animal or plant which is produced by the union of two distinct but closely allied species or genera. Extensive experiments have been made in relation to the crossing of species, and, although much knowledge and many productive results have been obtained, there is yet a wide field for experimental investigation. It is quite certain that successful crossing extends largely to different genera, but reproduction will not take place from the union of different orders. Plant hybrids are produced artificially by applying the pollen of one species to the stigma of a plant closely allied. The theory that hybrids are uniformly sterile and that this sterility is provided in nature to prevent the confusion of species was long held by scientists. Darwin pointed out in his "Origin of Species" that this view is generally erroneous, and that two fundamentally different facts have been confounded by many writers, namely, the sterility of species when first crossed, and the impotence of the hybrids produced from them. His views imply that the sterility of various hybrids has arisen from divers causes and not from natural selection. He asserts that crosses between the progeny resulting from two breeds, called *mongrels*, are not uniformly sterile. From this fact he elaborates the view that there is nothing in the phenomena of hybridization from which to conclude that species had not existed at first as varieties.

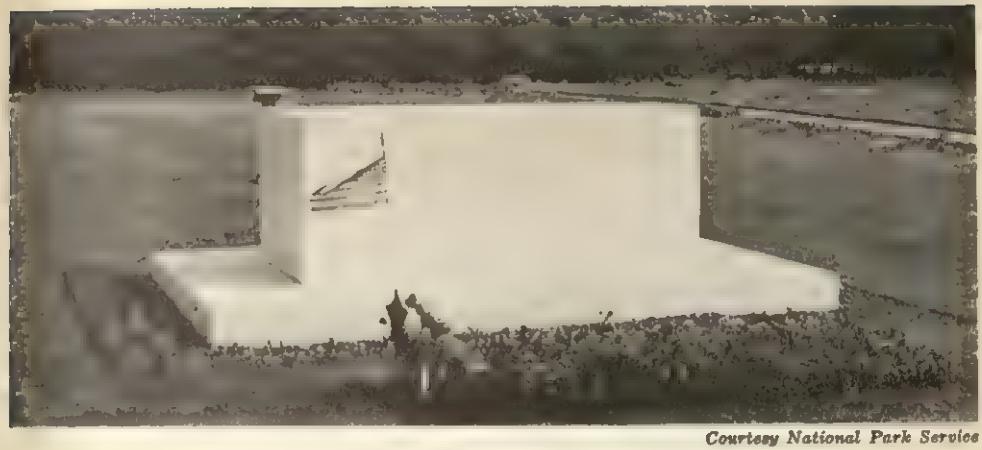
Hybrids are secured between the toad and the frog and between the swan and the goose. In fishes they result from artificial impregnation, as between different species of the carp. Among mammals they are produced from the copulation between the tiger and the lion, the fox and the wolf, the ibex and the goat, the horse and the ass, the he goat and the female sheep, and the horse and the zebra. In many cases the hybrids are sterile, even though the crossing may be brought about without difficulty, while in other cases the act of conjunction may be more difficult but the hybrids produced are fertile. Generally it is impossible to secure offspring from crossing different species, but where it is possible it takes place between animals or plants having a fair degree of likeness. Some hybrids are sterile among themselves, but fertile with their parents. Usually the degree of fertility depends upon various physical peculiarities differing in degree among various species.

Hyde (*hīd*), ARTHUR M., cabinet member, born at Princeton, Mo., July 12, 1877; died in New York City, Oct. 17, 1947. He practiced law in Missouri and was governor of the state, 1920-24. He was secretary of agriculture in the cabinet of President Hoover and resumed his law practice in Trenton, Mo., in 1933.

Hyde, DOUGLAS, statesman and educator, born in Frenchpark, Ireland, in 1860; died July 12, 1949. He studied at Trinity Coll., Dublin, where he took a special interest in Irish literature, which enabled him later to publish many standard works in Gaelic. The movement for the preservation of the Irish language met his hearty support; he prepared a number of texts and advocated the use of Gaelic in the home. From 1909-32, he was professor of Modern Irish at the National Univ. of Ireland. He also took an active interest in the Irish national movement from its inception and was the first president of the Gaelic League (1893-1915). A member of the Senate of the Irish Free State (1925-26 and 1938), he was President of Eire, 1938-45.

His writings include: "Gaelic Songs and Folk Tales," "Literary History of Ireland," "Story of Early Irish Literature," "Beside the Fire," "The Religious Songs of Connacht," "An Leath-rann," and "Mise Agus an Connradh."

Hyde Park, a public pleasure ground in London, England, occupying an enclosure of 400 acres. Formerly it was a park of the manor of



Courtesy National Park Service

GRAVE OF FRANKLIN DELANO ROOSEVELT AT HYDE PARK, N. Y.

Hyde, belonging to Westminster Abbey, but in the reign of Henry VIII the grounds came into possession of the crown.

Hyde Park, a popular suburb of Boston, Mass., on the Neponset River, about 8 m. s. of the State House. It is on the New York, New Haven & Hartford R.R. and is a favorite residence for Boston businessmen. The chief buildings include the public library and a number of schools and churches. The manufactures include machinery, cotton and woolen goods, and curled hair. It was incorporated with Boston in 1912.

Hyde Park, a town in Dutchess County, New York, on the N.Y. Central R.R., 78.5 m. N. of New York City. It is the site of the home and grave of the late President Franklin D. Roosevelt (*q.v.*) which have been set aside as a national historic site, formally dedicated to the nation on Apr. 12, 1946. The site comprises 33.23 acres of land and is administered by the National Park Service. There is also the Franklin D. Roosevelt Library, which houses the official and personal papers of the former President.

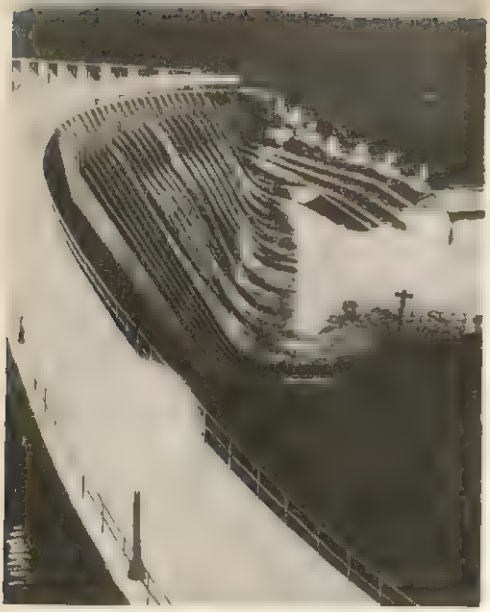
Hyderabad (*hī'dēr-ą-bād*) or HAIDARABAD, a city in India, capital of Andhra Pradesh state, on the Musi River. About 380 m. S.E. of Bombay, it lies 1,800 ft. above sea level. Its products include pottery, textiles, paper, and carpets. Osmania Univ. and Nizam Coll. are located here. Before 1956 the city, which dates from 1589, was capital of a state of the same name. The state refused to enter the Indian Union in 1947, but its nizam (ruler) accepted Indian sovereignty in 1948. Population, 1951, 1,085,722.

Hyderabad, a city in West Pakistan, on the Indus River, 100 m. N.E. of Karachi. It is noted for its handicraft products—embroidery, jewelry, and lacquer and enamel wares. The city was founded in 1768. Population, 1951, 241,801.

Hyder Ali (*hī'dēr ä'lē*), Indian prince, born in Mysore, in 1718; died Dec. 7, 1782. He was the son of a general of the Rajah of Mysore, succeeded to the same office, and soon after obtained Bangalore in fief as an inheritance. In 1759 he became regent ruler of Mysore and added Onor, Bednor, Calicut, and other adjacent districts to his dominion, making a total of about 84,000 sq. m. His attention was turned to the development of agriculture, commerce, and educational arts, and by reorganizing the army he was able to persevere successfully against the encroachment of the British. While the latter were at war with the French in 1778, he and his son, Tipoo Sahib, occupied the country within 40 m. of Madras, but they were later defeated under Sir Eyre Coote. His son succeeded him and likewise promoted civilized arts and protected religion, but he and his people were finally suppressed by the British.

Hydra (*hī'drą*), in Greek mythology, a monster serpent with nine heads. It was the offspring of Typhon and Echidna and infested the vicinity of Lake Lerna, where it committed great depredations among the herds. To slay this monster was one of the 12 labors of Hercules. Accordingly he proceeded in the task, being assisted by his servant Iolaus, but as each head was stricken off by his club two new ones grew forth. Hercules next burned away the heads of the hydra, but the center head, being immortal, he buried under an immense rock. Into the poisonous blood of the monster he dipped his arrows, which ever afterward rendered wounds inflicted by them incurable.

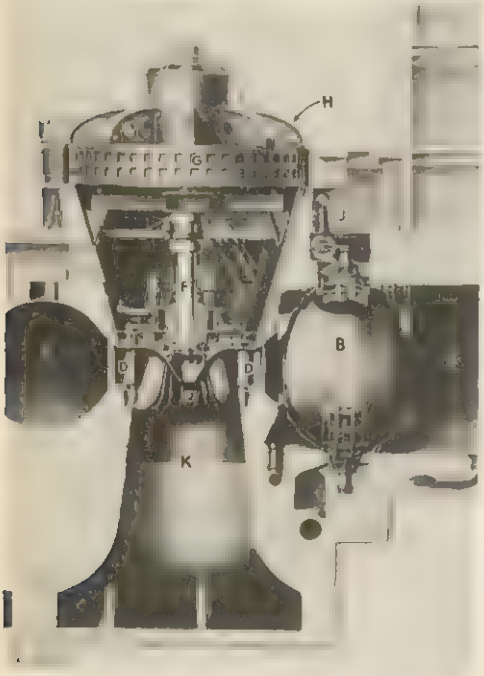
Hydra or IDHRA, an island of Greece off the coast of Pelopponese Morea, in the southern Aegean Sea. It is part of the department of Argolis and Corinth. About 11 m. long, Hydra has an area of *ca.* 20 sq. m. The surface is rocky and barren, and the shores are steep. While under Turkish sovereignty, the Hydriotes, reputedly among the world's best sailors, carried on extensive trade with foreign countries, but the major industry at present is sponge fishing. Hydra (pop., *ca.* 4,800), the island's port and



Photos courtesy Allis-Chalmers, Milwaukee, Wisc.

DAM AND POWER HOUSE

HYDRAULIC TURBINE



HYDRAULIC INSTALLATIONS IN DAM CONSTRUCTION

Dam and power house (*top*) showing spillway with surplus water passing over. The penstocks (ducts or conduits) leading from the reservoir to the hydraulic turbines in the power house can also be seen.

In this reaction-type hydraulic turbine (*bottom*) with electric generator *G*, water is received from forebay (reservoir) through penstock *A*, through shut-off butterfly valve *B* with its operating mechanism *J*. Spiral casing *C* delivers water equally around the turbine through the governor-controlled wicket gates *D*, thence through runner *E* and out draft tube *K* to tailrace. Main shaft *F* transmits rotating power of the runner to generator rotor. Frame *H* supports revolving weight of turbine and generator. This turbine generates 54,000 h.p. under 89 ft. head.

chief city, is located on the northwestern coast. Hydra's inhabitants led in the early 19th-century war for Grecian independence from the Ottoman Empire. Population, *ca.* 10,000.

Hydra, or HYDROID, a fresh-water polyp found in ponds, so named because its buds resemble the Hydra of mythology. It is usually found attached by a basal sucker to sticks, stones, and other objects in the water. The body, large enough to be visible to the naked eye, is extensible, and the terminal mouth is surrounded by a varying number of tentacles. The hydra is one of the simplest forms of many-celled animals, the body being a simple tube. Hydras reproduce asexually—by budding—or sexually, the ovaries and testes appearing on the same individual. Young hydras may bud out from the sides of the older ones, becoming detached when sufficiently mature and then resembling a smaller version of their parents. The hydra is capable of regenerating lost parts, and pieces of the animal more than ⅛ mm. in diameter may grow into complete individuals. The hydra's food consists of small animals which are paralyzed by the barbed cells of the tentacles. The tentacles carry the food to the mouth of the hydra, through which the food enters into an internal digestive cavity where the nutritive parts are absorbed. Indigestible portions are expelled through the mouth. The hydra is a member of the coelenterata (*q.v.*). Of the eight species occurring in the U.S., the common brown species (*Pelmatohydra oligactis*) is that usually employed in laboratory experiments.

Hydrangea (*hī-drān'jē-ą*), a genus of plants in the saxifrage family, including about 80 species. Ornamental deciduous shrubs, the cultivated hydrangeas, originally Asiatic and North American, have oval, often toothed, leaves and showy clusters of pink, white, or blue flowers. The white-flowered *Hydrangea arborescens grandiflora* is sometimes called Hills of Snow; the blue- or white-flowered *Hydrangea paniculata grandiflora* is commonly called the Peegee hydrangea.

Hydraulics (*hī-drô'lĭks*), the science of the mechanical actions of liquids. The word comes from the Greek *hydros,* water, and *aulos,* a pipe. In engineering, hydraulics provides a means of obtaining very high pressures. The basic principle is shown in Figure 1. A closed conduit connects two open vessels, one with an area of 1 sq. in., the other of 100 sq. in. A 1-lb. weight on the

narrow side balances a 100-lb. weight on the wide side, for the pressure in each case is 1 lb. per square inch. If a slight extra force is applied to the 1-lb. weight, it will be moved downwards and raise the 100-lb. weight, but if the 1-lb. weight moves downward 1 in. the 100-lb. weight will be moved upward only 1/100 of an inch.

An important application of hydraulics is the hydraulic press, which is widely used in metallurgy for drawing, punching, straightening, and forging, and in the formation of plastic articles and laminated sheets.

The pressures used in hydraulic systems range from a few pounds per square inch up to 10,000 lb. per sq. in. The liquid used is often water, but may be petroleum oils or silicones.

The pressure in a hydraulic system must be generated by a hydraulic pump, which provides energy for the system. There are three basic types of hydraulic pump: reciprocating pumps, in which a piston moves backward and forward in a cylinder; gear pumps, in which two gears mesh closely in a case—on the outside they move the liquid forward, but the liquid cannot return where the gears engage together; and rotary pumps, which depend on an eccentric rotor with valves placed so that liquid is taken in at the point of greatest volume and forced out at the discharge point. The hydraulic system must also contain transmission lines and some form of actuator, which resembles a pump in reverse. Often there is an accumulator, which stores energy, in case the load is intermittent. This may be a pressure vessel with a weight-loaded plunger or a closed vessel in which a gas is compressed. There must also be controls, which in some systems are very complex, so that a whole series of operations may be carried on automatically.

Hydraulic systems have many other uses besides the production of heavy pressures. They are used to supply energy to machine-tool drives. They are capable of very precise control and are used for planers, shapers, grinders, and milling machines. An intricate part can be cut automatically, from a tracer outline guiding the machine, with an accuracy within ten one-thousandths of an inch. A more familiar application of hydraulics is the hydraulic jack used in garages for raising automobiles.

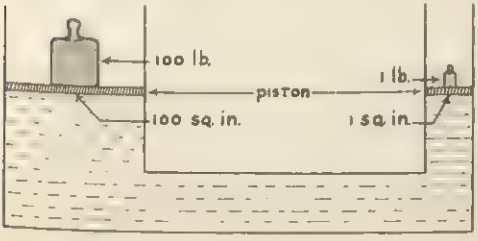


FIGURE 1

Hydraulics is also applied in automobiles in the "hydromatic clutch." The principle of this is that a fan, *i.e.* an electric fan, can be used also as a windmill. For example, if an electric fan is placed opposite another fan (disconnected from its motor), the wind from the first fan will *drive* the second. A hydraulic clutch consists of two hemispherical members, which are, in effect, fans: they are close together, and the space between them is filled with oil. The one connected to the engine can drive the one connected to the road wheels, but since there is no rigid connection nothing breaks if you hold the car stationary with the brakes with the clutch in and the engine going. Control is exercised by limiting the amount of fluid entering the space between the members. The less fluid in the driving member the less force is exerted on the driven member, and the slower it revolves when the load remains constant.

Hydrocarbon (*hī-drō-kär′bən*), a compound of hydrogen and carbon. There are many hydrocarbons, of which the two main types are the aliphatic compounds and the aromatic compounds. In the aliphatic substances, the carbon atoms are linked in chain formation. In the aromatic series, the carbon atoms in the end positions are linked to form a closed ring. The aliphatic or fatty compounds are divided into saturated and unsaturated members. In the saturated compounds, all four valences of each carbon atom are satisfied, so that addition compounds with hydrogen, bromine, chlorine, etc., are not formed. The saturated, aliphatic hydrocarbons form the methane or paraffin series, corresponding to the general formula C_nH_{2n+2}. Methane or marsh gas, CH_4, is the first member of the series. The lower members are gases, the higher members, solids. The intermediate are liquids. Octane, C_8H_{18}, is an important member for aircraft engines. Crude petroleum is rich in members of this series and yields, on fractional distillation, gasoline, benzine, kerosene, lubricating oils, and waxes. The unsaturated, aliphatic hydrocarbons comprise the olefines or ethylene series, C_nH_{2n}, and the acetylene series, C_2H_{2n-2}. They are called unsaturated because the four affinities of each carbon atom are not wholly satisfied, so that some of the carbon atoms have to "double up" to form a stable compound. That is, a pair of adjacent carbon atoms are doubly or trebly linked, and such compounds can form additional products at the site of the multiple linkage, with hydrogen, bromine, chlorine, etc. The formula for ethylene may be represented by $\begin{matrix} H & H \\ C = C \\ H & H \end{matrix}$, and that of acetylene by $HC \equiv CH$. The ethylene and acetylene series show a similar range of physical properties to the methane series; the lower members are gases, the intermediate members are liquids, and the

higher members are solids. The aromatic hydrocarbons show a closed chain grouping or ring formation of the carbon atoms. By far the most important member is benzol, C_6H_6, and the benzol ring, usually represented as an equilateral hexagon, is the keystone of the organic, synthetic dye industry. Because of the richness of coal-tar in benzol and its derivatives, the great family of aromatic hydrocarbons is sometimes referred to as coal-tar compounds. Benzol is also known as benzene (this must not be confused with benzine which is a petroleum distillate intermediate between gasoline and kerosene). The synthetic organic compounds in which the benzol ring occupies a key position comprise not only dyestuffs, but explosives, TNT, pharmaceuticals, aspirin, arsphenamine, sulfa-drugs, resins, plastics, and innumerable other chemical products.

Hydrochloric Acid (*hī-drô-klō'rĭk ăs'ĭd*), or MURIATIC ACID, a corrosive gas consisting of equal volumes of hydrogen and chlorine. It is colorless, has a suffocating odor, and has a marked affinity for water. Great quantities are obtained in making soda, by the acting of sulfuric acid on common salt. During volcanic eruption this gaseous compound is set free, and so is found in the water of lakes and rivers that have their source in volcanic formations. In medicine it is used in a greatly diluted form as a tonic and an astringent. Its chief commercial use is in manufacturing bleaching powder and in preparing phosphorus, glue, artificial waters, and carbonic acid.

Hydrofluoric Acid (*hŷ-drô-flû-ŏr'ĭk ăs'ĭd*), a volatile liquid obtained by the action of sulfuric acid on fluorite. It is colorless and very corrosive and has a pungent, suffocating odor. Since it attacks all silicates, such as glass or porcelain, it is employed chiefly for etching upon glass and to decompose and dissolve silicates in mineral analysis. To preserve it for use, it is necessary to keep it in a vessel made of lead, rubber, platinum, or gutta-percha.

Hydrogen (*hī'drô-jĕn*), symbol H, element No. 1, the lightest of all elements, first investigated by Sir Henry Cavendish in 1766. Hydrogen was originally assigned an atomic weight of 1 and used as the basis of measurement for all the other elements. Later oxygen was assigned an atomic weight of 16 and used instead as the unit of measurement to give the other elements weights closer to whole numbers. This change of standard then made the atomic weight of hydrogen 1.0080. In late 1961, carbon-12 was chosen as the unit base for atomic weights, giving hydrogen the atomic weight of 1.00797.

Hydrogen has three isotopes: protium, H^1, with a relative mass of 1; deuterium (as in heavy water), H^2, mass 2; and tritium, H^3, mass 3. An atom of hydrogen contains one proton and one electron. Its isotopes contain, in addition, one or two neutrons.

Hydrogen is an odorless, tasteless, colorless gas that is flammable. Its boiling point is −253° C.; its freezing point is −259° C. Thus, it is liquid only over a 6° range at a very low temperature. Between 9 and 65 per cent of hydrogen in air forms an explosive mixture. One of the most abundant of elements, it is rarely found in the free state, except in gases escaping from volcanic vents or petroleum deposits and in small traces in the air, though it is known to comprise much of the gaseous matter surrounding the sun and certain stars.

Hydrogen combines readily with oxygen to form H_2O (water), or H_2O_2 (hydrogen peroxide, an unstable compound that decomposes easily into water and oxygen while giving off heat). Hydrogen is chemically rather inert at normal temperatures, because the two atoms that make up the hydrogen molecule are strongly bonded (covalent bonds), requiring much energy to separate them so they may enter into combination with other elements. Combination is usually made at elevated temperatures. Thus, at high temperature, hydrogen combines with nitrogen to form NH_3 (ammonia). Nonmetallic hydrogen compounds are usually gaseous and volatile; salts or hydrides of hydrogen are crystalline materials. In combination with metals, hydrogen is usually absorbed or alloyed. With carbon, hydrogen forms the large number of compounds known as hydrocarbons; with nitrogen hydrogen forms hydronitrogens, such as ammonia and N_2H_4 (hydrazine, a colorless liquid used as a reducing agent in organic synthesis and as a rocket fuel); with sulfur, hydrogen forms H_2S (hydrogen sulfide); and with chlorine it forms HCl (hydrogen chloride). Hydrogen and chlorine do not react if mixed at room temperature in the dark, but will explode violently in direct sunlight. With silicon hydrogen forms silanes, with tin, stannanes, and with boron, boron hydrides.

Hydrogen may be obtained from its compounds. It is liberated from water by action of an electric current or by the action of certain metals, such as sodium, potassium, and calcium, on water. It can be liberated from acids when zinc, iron, aluminum, or magnesium, is brought into contact with them. For example, if hydrochloric acid is poured over granulated zinc in a jar, the gas escaping from the effervescent mixture is hydrogen, and it may be lighted to give the typical pale-colored but very hot hydrogen flame. Zinc and aluminum react with some of the bases, especially sodium hydroxide (NaOH) to liberate hydrogen.

Hydrogen is used in the manufacture of ammonia; for the "hardening" of oils and fats;

in the hydrogenation of coal and the cracking of petroleum into lubricating oils, gasolines, etc.; in the manufacture of methanol (wood alcohol); in the furnace treatment of metals; in oxyacetylene and oxyhydrogen blowtorches where hydrogen or C_2H_2 (acetylene) is burned to give flames above 3000° C. for welding metals; and in the atomic hydrogen torch that separates molecular hydrogen, with an electric arc, into hydrogen atoms that are recombined to release heat while hydrogen is burning in oxygen, giving a total heat of 4000° C.

Hydrogen Bomb (also called superbomb, H-bomb, fusion bomb, or thermonuclear device), the most powerful bomb, first achieved by the U.S. in 1952 as a result of research started in 1950. The hydrogen bomb was suggested in 1942, after contemplation of the theory that the heat of the sun is due to the conversion of hydrogen into helium. The third isotope of hydrogen, tritium, contains one proton and two neutrons. An additional proton added to it would change it into an alpha particle, consisting of two protons and two neutrons. The alpha particle is actually a helium ion, *i.e.*, a helium atom minus its two electrons. The fusion of tritium with a proton would release tremendous energy, and the process, usually referred to as the "conversion of hydrogen to helium," is supposed to give the sun its heat. But such a fusion would require tremendous temperatures, and these were unattainable in 1942. After the development of the atomic bomb (*q.v.*), its tremendous heat seemed to be a source for that needed to start the hydrogen reaction. The atomic bomb is based on the fission of heavy elements into lighter substances and the consequent release of energy. But energy is also released when lighter elements are fused into heavier substances, and the light weight of tritium compared with uranium indicated that the same weights would yield eight times more energy in the case of the hydrogen reaction than in the uranium reaction, and thus make possible a more powerful bomb that could be further amplified. An H-bomb includes time detonators and fuses to set off conventional explosives that drive fissionable material (uranium or heavier elements) into a core to start the heat and radiation reaction of the atomic bomb. This in turn triggers the hydrogen reaction. Hydrogen is supplied, in the form of a mixture of its isotopes, for the conversion of the tritium into alpha particles, or as a unit of tritium surrounded by hydrogen in the form of one of its compounds, water, hydrazine, acetylene, etc. Hydrogen in addition to tritium must be provided as a source of the additional protons to be united with the tritium to form alpha particles (helium ions) and emit energy, part of which is powerful gamma radiation and part kinetic energy.

The power of the hydrogen bomb can be amplified by enclosing the uranium component in metal shells that will release additional neutrons when bombarded by neutrons from the uranium reaction. Metals such as cobalt, nickel, and copper thus bombarded would give extra neutrons to combine with ordinary hydrogen to produce more tritium (one proton plus two neutrons). Additional power might also be achieved by enclosing the hydrogen component in a lithium shell, from which neutrons and protons can be obtained to unite with protons from ordinary hydrogen to produce helium ions (each consisting of two protons and two neutrons).

Wide World Photo

OVER THE MARSHALL ISLANDS
From 12,000 ft. above the ground, 50 m. from the demolition point, the results of the first hydrogen bomb explosion in 1952 looked like this several minutes after the bomb had burst

Hydrogen Dioxide (*dī-ŏk'sīd*). See *Hydrogen Peroxide*.

Hydrogen Peroxide (*pĕr-ŏk'sīd*) or HYDROGEN DIOXIDE, a colorless liquid, H_2O_2, with a freezing point of −0.43° C. and a boiling point of 150.2° C. Formerly prepared by the action of acid on barium peroxide, it is now manufactured by electrolysis of a solution of sulfuric acid or acidic ammonium bisulfate. It is available commercially in dilute solutions, with water and a stabilizer, as a household disinfectant and bleach. In stronger concentrations it is used for bleaching cotton, wool, synthetic fibers, paper pulp, and hair; as an agent to release gas bubbles to puff up latex into foam rubber; and as an energy source for rockets and an analytic reagent. Concentrated

H_2O_2 when combined with organic material will ignite or, subjected to mechanical shock, will detonate.

Hydrogen Sulfide (*sŭl'fīde*), also known as SULFURETTED HYDROGEN or HYDROSULFURIC ACID, a gas, H_2S, heavier than air, distinguished by its disagreeable odor—like rotten eggs, of which it is a component. Hydrogen sulfide occurs widely in nature as the result of the decay or heating of sulfur-containing organic materials or the hydrolysis of sulfur-containing inorganic materials. It is thus found in petroleum, natural gas, all natural waters, volcanic eruptions, earth seepages, and in all putrefying animal or vegetable matter. It is only slightly soluble in water but soluble in organic solvents. It is a weak dibasic acid, very toxic, and easily identified by its odor in very small percentages. It can be produced by the action of hydrochloric or certain other acids on ferrous sulfide, by decomposing thioacetamide, by the reaction of paraffin and sulfur, and by the hydrolysis of some sulfides. Formerly an unwanted by-product of oil refining, it is now used as a source material for sulfur or sulfuric acid discovery. In mining, hydrogen sulfide is employed in the flotation process of ore treatment. It is also useful in analytical chemistry.

Hydrography (*hī-drŏg'rą-fī*), the science dealing with the study and description of all the waters of the earth's surface. Particular points studied include physical features, bottom contours, tides, and current direction, speed, and volume. Hydrography is also that branch of surveying dealing with these matters and includes the construction of charts demonstrating such features. See also *Ocean*.

Hydrolysis (*hī-drŏl'ĭ-sĭs*), the chemical separation or splitting of a compound into its parts by means of water. The water acts by giving up its hydrogen ion (H^+) or its hydroxide ion (OH^-) or both, to combine with the cleaved parts of the compound. Thus, a hydrolysis reaction is a reaction of the ions of a salt with the ions of water. Salts composed of a strong base and a weak acid, when dissolved in water, yield a dilute alkaline solution, for example, the salt sodium carbonate, Na_2CO_3, which is formed from sodium hydroxide, NaOH, and carbonic acid, H_2CO_3. Salts formed from a weak base and a strong acid, after hydrolysis (dissolving in water) yield a weak acidic solution, for example, the salt ammonium chloride, NH_4Cl, which is formed from ammonium hydroxide, NH_4OH, and hydrochloric acid, HCl. Heat is necessary in some cases to achieve the hydrolysis reaction.

Hydromagnetism (*hī-drō-măg'nĕ-tĭz'm*). See *Magnetohydrodynamics*.

Hydrometer (*hī-drŏm'ĕ-tĕr*), an instrument for determining specific gravity (*q.v.*) of a liquid. It consists of a small glass tube to which two larger bulbs are sealed, one above the other. In order to keep the stems of the instrument vertical, a weight, either mercury or small shot, is put into the lower bulb. The upper end of the stem is graduated decimally, and the instrument sinks to the point marked zero when immersed in water. A liquid that is heavier than water will not permit it to sink to the zero point, while one lighter than water will permit it to sink below the point marked zero. Special forms of hydrometers are used for particular liquids. A *lactometer* is used for testing the purity of milk, and an *alcoholmeter* for determining the percentage of absolute alcohol in spirits.

Hydrophobia (*hī-drō-fō'bĭ-ą*), or RABIES, a disease which is communicated by the bite of a rabid animal, due to a specific virus in the saliva. Dogs are the most liable to be afflicted. The disease can be transmitted to humans through the bite of an infected animal. In hydrophobia the patient experiences spasmodic muscular contractions. The symptoms of the disease appear from two weeks to several months after infliction of the bite; and death may result a few days later unless proper measures are taken. In 1884 Louis Pasteur (*q.v.*) showed that dogs could be protected from the disease with inoculations of the dried spinal cords of other infected animals. In July 1885 he successfully inoculated the first human patient. If given promptly, the treatment—daily injections extending over a period of one to two weeks—prevents the appearance of the disease in animals or human beings.

Hydrostatics (*hī-drō-stăt'ĭks*), the branch of physical science which deals with the properties of fluids at rest. Its principles apply to all fluids, but liquids, which are only slightly compressible, must be treated differently from gases, which have a greater compressibility. In all discussions of hydrostatics two terms are involved: pressure and density. The pressure at any point in a liquid signifies the force exerted upon unit area. At any point in a liquid at rest the pressure is the same in all directions. It varies with the depth of the liquid but is independent of the amount of the liquid or the shape of the containing vessel. The density of any fluid, liquid or gas, is its quantity of matter per unit volume.

A fundamental principle of hydrostatics was discovered by Blaise Pascal (1623-62) in 1653. This principle states that the pressure exerted upon a liquid is transmitted undiminished in every direction and acts at right angles to every surface of the containing vessel. In the hydraulic press use is made of this principle by filling two connected cylinders with water. This type of press is used in baling cotton and paper, lifting heavy loads, and in exerting large forces generally.

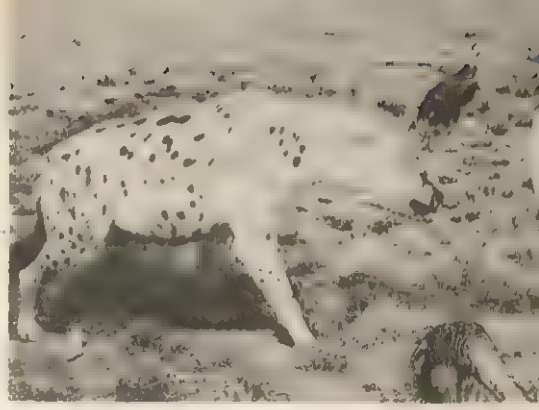
The Greek philosopher Archimedes (287-212 B.C.) found a law of hydrostatics equally appli-

cable to liquids and gases. This law states that a body wholly or partially submerged in a fluid is buoyed up with a force equal to the weight of the fluid displaced. The law explains the flotation of bodies, for a body floating upon the surface of a liquid will sink until it displaces a weight equal to its own weight. The upward force exerted by the displaced liquid is called buoyancy, and all liquids exert buoyant forces upon solid objects either wholly or partially submerged. In the same way the atmosphere exerts a buoyant force upon a balloon filled with hydrogen or helium gas. Because the atmosphere consists of compressible gases, the height to which the balloon will rise is limited. At some upper level of the atmosphere the weight of the displaced air just equals the weight of the balloon, and the latter floats in equilibrium.

Hydrotherapy (*hī-drō-thĕr'ə-pĭ*), the treatment of disease by the use of water in any of its forms, *i.e.*, ice, liquid water of various temperatures, or vapor. The method of application varies, as does the duration of the treatment. Compresses, douches, packs, and baths are typical methods of application. Among examples of hydrotherapy are continuous baths or warm packs, employed to produce a sedative effect in the treatment of psychotics; the short use of cold water to produce a stimulating effect, used to revive a fainting person; sponge baths or compresses, used to relieve high fever; and ice or cold compresses, used to reduce pain or inflammation.

Hydrozoa (*hī-drō-zō'ə*), a class of polyps and jellyfish including types which vary in habits and structure. Some are free-swimming, some are not.

Hyena (*hī-ē'nə*), a genus of flesh-eating quadrupeds found in Asia and Africa. They are characterized by strong teeth well adapted to breaking the bones of their prey, extended claws, a rough tongue, prominent eyes, long and acute ears, and forelegs longer than the hind limbs. Their gait is shambling, but they are able to move with considerable speed. Long, coarse hairs cover the body and form a mane and enlargement on the back. They feed on carrion, but also on fresh flesh, and devour carcasses in an advanced state of decay. Their claws are well adapted for digging, on account of which they are reputed to dig into newly made graves. At night they come out of their places of seclusion and gather in packs like coyotes, often attacking domestic animals and even children. At least four species are recognized, of which the *striped hyena* of Western Asia and Northern Africa has been known the longest. The ancients knew of these animals and attributed many peculiar habits to them. A closely related species called the *spotted hyena* is found in South Africa. It has a yellowish color with numerous spots, and is more ferocious and somewhat smaller than the striped hyena. The *strand wolf* is a species allied to the spotted hyena, has a grizzled-brown color, and is found in the vicinity of the Orange River. The *brown hyena* is native to Natal and the southeastern part of Africa. Remains of extinct species occur in Germany, France, and England. They are known as the cave hyena, from their remains occurring in caves formed during the glacial epoch.



Courtesy American Museum of Natural History, N. Y.

SPOTTED HYENA

Hygeia (*hī-jē'yə*), or HYGIEIA, in Greek mythology, the goddess of health, daughter of Aesculapius. Artists represent her as a virgin in flowing garments feeding a serpent from a cup, while poets speak of her as a goddess with bright glances and a favorite of Apollo. The Romans identified her with the goddess Salus.

Hygiene (*hī'jēn*), the branch of medical science which relates to the preservation and improvement of health, both in individuals and communities. This branch of study has been receiving increased attention within recent years, and by means of modern agencies it has been possible to both improve the general health and materially prolong human life. The period in which delicacy was considered an element of beauty has passed away, and it is now sought to so develop the body in its powers and usefulness that it may be a fit dwelling for the mind and soul. Strength and vigor physically are looked upon as personal and national blessings, while weakness and timidity are deplored. Not only is it sought to provide the most highly sanitary conditions for the preservation of health in individuals, but a public policy is pursued by the authorities, and institutions are maintained under which the most favorable conditions of healthy living may be vouchsafed to all classes of people in rural and urban districts.

The word "hygiene" is derived from the name of the Greek goddess of health, Hygeia. The evolutionary forerunner of modern hygiene is to be found, to a large extent, in the health concepts and practices of the ancient Greeks. The Greeks believed in the supernatural origin of illness, holding to the theory that it came from the gods. Today, of course, it is known that disease arises

from natural causes that can be explained by the knowledge of science. Though public hygiene has been made a subject of investigation by the leading nations for many centuries, definite aims regarding the promotion of public health and the prolongation of human life did not take form until the beginning of the 18th century.

Modern hygiene has a twofold aim. It is intended to preserve health through the prevention of disease and injury, and to promote good health. Good health is more than absence of disease and injury. It is a state of complete physical, mental, and social well-being. The mind and body of an individual who is in good health are in the finest possible working order.

Community hygiene is concerned with health measures which affect all citizens. Its purpose is to provide and to safeguard healthful living conditions for the public at large. City, state, and national laws include rules of hygiene. Supervision of the sale of foods and drugs, establishment of sewage and garbage disposal systems, purification of water supplies, are but a few examples of public hygiene measures.

Community hygiene programs are largely responsible for the decline in the number of deaths from certain diseases in this country. The decreased death rate of the nation and its increased life expectancy are due in large measure to successful campaigns against communicable diseases. Such discoveries as those of Jenner in relation to vaccination against smallpox, those of Koch in the treatment of tuberculosis, the discoveries of antitoxin as a remedy in diphtheria, and many others equally important have had a marked influence in preserving human life.

Since about the turn of the century the threat from typhoid fever, dysentery, diphtheria, etc., which used to claim thousands of lives each year, has geen greatly reduced by sanitation, immunization and other programs of mass control. Instances of this are seen in the laws regulating the exposure of persons affected with serious contagious diseases. Pure air is an important essential in promoting public hygiene, since we consume it infinitely beyond our consumption of food. This has been recognized by the government and city authorities, which is evidenced in the regulations requiring cleanliness in cities, providing for the grading of sites, and stimulating numerous other sanitary measures. Material advancement in our knowledge of the sciences and the regulation by law of the practice of medicine, especially such as requires rigid examination for admission to practice the profession, have likewise been material agencies in public hygiene. Much progress has been made in the construction of jails and prisons, which formerly contained few provisions calculated to maintain the health of those confined, while now the most wholesome sanitary rules are enforced with much care.

Another prolific movement in stimulating the public health is found in the construction of well ventilated and lighted school buildings provided with adequate sanitary conditions.

Public health services arose out of attempts to combat public health disasters, such as epidemics. Gradually the public realized the necessity for permanent health organizations. In the U.S., administrative health practice developed on three levels: Federal, state, and local. The functions of these agencies are largely similar in scope, but are limited geographically as to their sphere of influence and activity. Federal public health agencies are responsible for public health problems of national and international significance, the solution of which lies outside the province of any single state. They aid, guide, and stimulate the states in the development of their public health programs. State health departments have jurisdiction over public health problems within the boundaries of each state and administer state public health laws. In addition, they guide and stimulate local public health activities. Local health departments—county and city—administer and provide local public health services which affect the individual citizen directly. The U.S. Public Health Service (*q.v.*) is the principal Federal agency responsible for the promotion of national health in the U.S.

Personal hygiene concerns the private actions of individuals and can help the individual reach the highest attainable standard of health. It covers such matters as diet, eating habits, personal cleanliness, posture, exercise, and ventilation and lighting. Personal hygiene is concerned not only with the care of the body. Mental conditions are also subject to the concepts and practices of hygiene. The task may be more difficult and uncertain, but the establishment of good mental and emotional habits is vitally important to the health of the total individual.

Personal hygiene includes medical and dental care, which in turn includes such matters as periodic examinations and the like. Such items as immunizations are matters of personal hygiene but are of public health importance and thus concern the community. Many states and communities require vaccination or immunization of persons against certain diseases. Although much of personal hygiene may be left with the individual, the function of dissemination of information to the individuals is generally considered a public health responsibility of primary importance. See also *Hygiene, Industrial.*

Hygiene, INDUSTRIAL (*hī′jēn, ĭn-dŭs′trĭ-ăl*), the study of health hazards encountered in the pursuit of occupations. It has assumed a dominant role in the whole picture of social and public welfare. As society gradually adjusted itself to

industrialization, it became obvious that the close collaboration of large groups in confined spaces involved special dangers to the health of the entire community; moreover, certain occupations were found excessively hazardous. Dust particles and fumes are unquestionably among the leading occupational dangers, especially in subsurface mining; inadequate ventilation formerly accounted for a large number of illnesses and deaths by causing the progressive deterioration of body tissue or by the accumulation of poisons set free in the air.

Despite the attitude held by certain early industrialists that the cost of health protection for the workingman did not justify itself in terms of income, economists soon realized that employers have a large stake in the welfare of their employees; poor ventilation, for example, not only entails the danger of atmospheric poisoning, but also reduces efficiency.

Since 1902, the U.S. Public Health Service has engaged in research in the field of industrial hygiene and has conducted surveys to determine the cause and control of serious occupational diseases such as silicosis in the quarrying industry, lead poisoning in storage-battery plants, mercurialism in the fur cutting and hatting industry, and many others.

Since 1936, Social Security grant-in-aid funds have been allocated to states for industrial hygiene services. Forty states now have industrial hygiene units in their departments of health or labor. These units, through surveys of industry and recommendations, promote the control of occupational hazards and the development of general health services for industrial workers.

Since 1912, countless laws and regulations have been passed by municipal, state, and federal legislatures covering conditions of work. Thirty-three states now have occupational-disease laws under which industrial workers receive compensation for disability caused by diseases of occupational origin.

Though much progress has been made, much work remains to be done to eliminate the lag between the development of industrial hygiene theory and its application. The practice of industrial hygiene is especially lacking in small plants employing fewer than 500 workers. See also *Occupational Disease.*

Hygrometer (*hī-grŏm'ē-tĕr*), an instrument for measuring the degree of moisture contained in the atmosphere. Various forms of this instrument are in use. It is an essential supply in the weather bureau of the government. The Daniell hygrometer consists of a bent glass tube terminating in two bulbs, one of which is covered with muslin, and the other is of black glass or is coated with metal. The latter contains some ether and a thermometer. When ether is poured on the muslin, the black ball, cooled by the evaporation of the ether within, is soon covered with dew. At this time the enclosed thermometer indicates the dew-point, and this, compared with the reading of a thermometer in the air, determines the humidity.

Hyksos (*hĭk'sôz*), meaning shepherd kings, the name of a dynasty of Egyptian kings who reigned from about 2200 B.C. to 1700, a period of 500 years. Their capital was at Tanis, the Zoan of the Bible. It is thought that their ancestors were nomadic tribes of Syrians and Arabians in Canaan, who later settled in Egypt, and while there adopted the customs and religion of that country.

Hymans (*hī'mạns*), PAUL, Belgian statesman, born in Brussels, Belgium, in 1866; died Mar. 8, 1941. After establishing himself as a lawyer, he entered politics and in 1900 was elected to the Chamber of Deputies. In 1914 he was appointed ambassador to Great Britain, but returned to Belgium in 1917, to serve as minister of economic affairs, becoming foreign minister the following year. In 1920 he was named president of the League of Nations Assembly and two years later was elected president of the Council of the league. He served as foreign minister of Belgium from 1924-25, 1927-34, and 1934-35, and from 1935 until his death was minister without portfolio. Hymans wrote extensively on law; and his books include "Parliamentary History of Belgium," "Modern Brussels," and "The Life of Frère Orban."

Hymen (*hī'mĕn*), in Greek mythology, the god of marriage. Some writers consider him the son of Apollo and one of the Muses, but others regard him a mortal who rescued some Attic maiden from robbers, after which hymeneal songs were written as a token of gratitude. The practice of singing such songs at the nuptial season became universal, and the heroic youth was gradually elevated to the rank of divinity. In works of art Hymen is represented as a tall, handsome youth, carrying in his right hand a bridal torch.

Hymnology (*hĭm-nŏl'ô-jĭ*), the science of sacred poetry, or the hymns used at a particular time or place. Formerly the term was restricted to hymns which were written to praise God in the form of songs, but it is now defined as a lyric expression of religious feeling. The Greeks dedicated many hymns to their gods and heroes and these were usually sung at festivals. The older Greek hymns, as those written by Homer, are chiefly descriptive and are classed with the epics, while those of Pindar and the later poets are largely lyric. Many hymns are contained in the sacred books of the Orient, especially the Vedas, and these have been translated extensively into the languages of Europe. However, the Jewish

psalms are the most familiar of all the sacred poems of antiquity and they have become familiar to all the Christian churches. Ambrose and a number of other Latin hymn writers have enriched literature with many lyric poems that have become well known in the civilized nations. These include "Stabat Mater" ("The Mother Stood"), "Dies Irae" (*q.v.*), and "Veni, Sancte Spiritus" ("Come, Holy Spirit").

The Reformation gave birth to much interest in sacred songs, which were made an instrument by the Protestants in spreading the new faith among the nations. It is especially noteworthy that Luther was a potent factor in forming and directing the writing of hymns, chiefly because he wrote in the common language of the people. His "Ein' feste Burg ist unser Gott" ("A Mighty Fortress is Our God") is still in wide use. To the same period belongs Martin Rinkart, the composer of "Nun danket alle Gott" ("Now Thank We All Our God"). Paul Gerhardt (*q.v.*) wrote a large number of sacred hymns and many of these were translated into English by John Wesley, including "O Sacred Head Once Wounded." Isaac Watts (1674-1748) is one of the most prolific English writers of hymns and is frequently referred to as the "father of English hymnody." His collection published under the title "Divine and Moral Songs for Children" was long a standard and popular work. Charles Wesley (1707-88) is the author of about 6,000 hymns, several hundred of which are still in popular use, and at least 20 may be classed among the favorite sacred songs in the English language. Other outstanding writers of hymns include the Englishmen, John Keble, William Cowper, Frances Ridley Havergal, and John Henry Newman, the last mentioned being the author of "Lead, Kindly Light," and the American, Dr. Lowell Mason.

The evangelistic movement of the 19th century was the means of producing and making popular a favorite class of church hymns. Some of these were not of a high order, but many were exceptionally appropriate and are at present in great favor among the Christian churches. These include: "Nearer, My God, to Thee," by Sarah Flower Adams; "Just as I Am, Without One Plea," by Charlotte Elliot; "My Faith Looks Up to Thee," by Ray Palmer; "Battle Hymn of the Republic," by Julia Ward Howe; "One Sweetly Solemn Thought," by Phoebe Cary; "Pass Me Not, O Gentle Saviour," by Frances Jane Crosby; "My Country, 'Tis of Thee," by Samuel Francis Smith; and "Onward, Christian Soldiers," by Sir Arthur Sullivan.

The music in use for hymns among the early Christians was heavy and somber, and many melodies were in the form of chants. These were rarely sung in the common language, but were more generally chanted in the Latin. Luther translated many of the popular tunes into German, thereby seizing the opportunity for reforming the church music as well as making it an instrument of education and public worship. Johann Sebastian Bach (*q.v.*) developed the structural side of music and emphasized the rhythmic element. The movement of reform in music spread to France and England in the 18th century. The popular epoch was reached in the latter country through the hymns of Isaac Watts and Charles Wesley. In the earlier period of this movement the music was rather somber and solemn, but later it became livelier in character. To the latter class belong the hymns used extensively by Moody and Sankey in America.

Hymns (*hĭmz*), NATIONAL. See *National Hymns.*

Hypatia (*hī-pā′shĭ-ȧ*), female philosopher, born in Alexandria, Egypt, about 355; died in 415 A.D. She was a daughter of Theon, mathematician and astronomer. Teaching astronomy, geometry, and philosophy in Alexandria, she provoked the hostility of Syril, Bishop of Alexandria, and she was subsequently murdered in a church. She wrote several treatises on mathematics, but they are not now extant. Charles Kingsley made her the heroine of his "Hypatia."

Hyperbola (*hȳ-pĕr′bō-lȧ*), a plane curve of two branches produced by the intersection of a conical surface and a plane parallel to the axis of the cone. The hyperbola belongs to the family of curves known as conic sections and is characterized by an eccentricity greater than unity. The hyperbola has two asymptotes. It has numerous uses in physics to represent quantities which are inversely proportional.

Hyperion (*hī-pē′rĭ-ŏn*), in Greek mythology, the son of Uranus and Gaea and the husband of Theia. He is represented as a Titan. Hesiod regards him the father of Helius, the sun god. See *Titan.*

Hyperons (*hī′pĕr-ŏnz*), in physics, unstable "elementary" particles whose masses fall between those of the proton (1836 electron masses) and the deuteron (3670 electron masses). By 1957, five hyperons had been discovered, each of which decays into two other elementary particles in about 10^{-10} sec. (one ten-billionth of a second). Hyperons were first discovered in cosmic rays but have since been produced in high-energy accelerators (*q.v.*). A *hyperfragment* is an atomic nucleus with one of its neutrons replaced by a neutral hyperon in the course of a high-energy nuclear reaction; it decays in 10^{-11} to 10^{-12} sec. See also *Meson.*

Hypertension (*hī′pĕr-tĕn-shŭn*), the persistent elevation of arterial blood pressure (*q.v.*) above the limits accepted as upper normal (140 mm. mercury, systolic; and 90 mm. mercury, diastolic). Temporary elevation may be pro-

duced by physical activity, nervous strain, fear, and outbursts of rage. There is a familial tendency toward the development of high blood pressure, but whether this is truly hereditary or produced by similar living patterns is still a subject for investigation. Overweight seems to be an important contributing factor, as are personality disorders characterized by suppressed hostility. Long-continued psychic trauma to the cardiovascular system results eventually in sustained hypertension.

The basic mechanism producing hypertension is the narrowing of the microscopically small arteries of the body, thus increasing the resistance to the passage of circulating blood through the peripheral circulation. To overcome the increased resistance, the heart must pump with increased force. The increased force damages the delicate lining of the blood vessels, producing thickening, which still further increases peripheral resistance. The smaller group of cases (secondary hypertension) may result from narrowing of the aorta (*q.v.*), acute or chronic kidney diseases, overactivity of the thyroid gland, heart disease, or disturbances of the adrenal gland (see *Glands*). About 90 per cent of all cases are classified as primary or essential hypertension, including all cases in which there is no, as yet, proven underlying cause. The accepted concept is that the autonomic nervous system (see *Nerves*) is the one common denominator in the development of hypertension. There seems to be a change in either the quantity or the quality of stimuli flowing from the sympathetic nervous system to the small blood vessels. There may be an alteration of the blood-vessel response to stimuli, or an interference with the mechanism, which blocks out some of the stimuli.

As the hypertension persists, it produces damage to the blood vessels, with secondary disturbances in vital organs, especially the heart, kidneys, eyes, and brain. The important factor to be considered in the evaluation of the mildness or severity of any particular case is not the height of the blood pressure but the nature and degree of its secondary effects. Many patients adjust to a relatively high pressure with no untoward effects. A complete examination of the heart must be made, and the functioning of the kidneys must be checked; a full examination of the eyes (especially of the retina) is essential.

Treatment must begin with the elimination of any underlying condition. Weight reduction and the restriction of salt in the diet have proven their worth. The establishment of a sensible way of life, with avoidance of excessive physical and mental fatigue, are essential. Drugs have been developed which are effective in lowering blood pressure by blocking the excessive flow of impulses from the sympathetic system.

Courtesy Bettmann Archive, N. Y.

DEMONSTRATION OF HYPNOTISM IN THE 1890's

In selected cases of great severity which do not respond to drug therapy, surgery (cutting the sympathetic nerves emerging from the spinal cord) has been tried, with considerable success. See also *Hypotension*.

Hypertrophy (*hī-pĕr'trō-fi*), in medicine, any kind of natural enlargement of an organ of the body. Glands, muscles, and inner organs may become hypertrophic as a result of any of several diseases or disturbances.

Hypnoanalysis (*hip'nō-ăn-ăl'ĭ-sĭs*). See *Psychiatry*.

Hypnotism (*hĭp'nō-tĭz'm*), from *hypnos*, Greek meaning sleep, the creation of an artificial state of sleep by means of hypnosis. Hypnotism is achieved by verbal suggestion, gazing into the eyes of the patient, or sometimes by physical touch. Sleep thus induced is so deep that the patient may be partially anesthetized and very suggestible. In a state akin to a trance, he will obey to the letter commands of the hypnotist. Since consciousness is lost, the experience is afterward forgotten.

This method of psychic treatment has been known throughout the history of mankind. Widely used by magicians, etc., it has been generally linked with charlatanry. Scientific use of hypnotism began with Franz Anton Mesmer (*q.v.*), in the 18th century. At the end of the 19th century, natural scientists, under the leadership of the French scholar Jean Martin Charcot (1825-93), began to examine seriously the conditions of hypnotism.

Although it has been found that persons subject to hysteria and other mental disturbances are particularly susceptible to hypnosis, others with well-balanced minds may also be affected in that degree to which they are willing to yield to the psychic influence.

Hypodermic Injection (*hī-pō-dĕr'mĭk*). See *Injection*.

Hypotension (*hī'pō-tĕn'shŭn*), blood pressure (*q.v.*) which is persistently below the normal range. In human beings it may be defined as a reduction below 110 mm. in the adult male or below 100 mm. in the female of any age. When no cause can be found, such a state is called *essential hypotension*. Those with essential hypotension suffer no ill effects other than greater

susceptibility to fatigue or to giddiness and headaches. They are less likely to be susceptible to heart and kidney disease, and so this condition is said to indicate that a longer life may be expected. Aside from the above type, low blood pressure occurs either as a temporary or permanent phenomenon in many conditions, such as hemorrhage, traumatic shock, anesthesia, tuberculosis, and other debilitating diseases, in heart failure, sometimes in cases of acute fevers, and in Addison's disease and hypothyroidism. Ordinary fainting is brought about by sudden occurrence of hypotension, with accompanying decrease of blood supply to the brain necessary for consciousness, due to upset of the nervous mechanism controlling heart action and tone of the blood vessels. Thus it can be seen why it is best to lower the head (forward between the knees) to prevent fainting or to revive one who is already in *syncope* (sudden state of unconsciousness due to inadequate blood supply to the brain).

Hypothesis (*hī-pŏth'ē-sĭs*), an assumption employed to direct inquiry and to solve the problem under investigation. In well-conducted inquiries, a hypothesis is adopted tentatively, and requires to be tested before it is regarded as well-established. Such testing consists in first deducing the logical consequences of the hypothesis, and then comparing these consequences with the results of observation and experiment. Accordingly, no hypothesis can be judged as satisfactory which is so obscurely stated that deductions from it cannot be made, or which is inherently incapable of being verified or refuted by experiment.

Some hypotheses are better established than others. Nevertheless, every hypothesis, however well established, is always subject to further criticism, and no hypothesis in the positive sciences is capable of demonstrative proof. For the possibility cannot be excluded that new facts of observation may disagree with a given hypothesis, or that a hypothesis quite different from the given one may also explain the known facts. Of two hypotheses, both of which account for a given body of facts, that one is preferable which is simpler and which has a greater field of potential application. The formulation of relevant and fruitful hypotheses is thus a major step in every inquiry; but no rules can be stated for inventing them.

A distinction is sometimes made in the sciences between a hypothesis and a theory, but the distinction is not a very precise one; a whole group of hypotheses or a more inclusive hypothesis is usually called a theory, while a single assumption having a fairly narrow scope is designated as a hypothesis. Another distinction that is frequently drawn is between descriptive and explanatory hypotheses. The former are those which assume that a causal connection believed to hold in a restricted domain of fact holds universally (*e.g.*, the Newtonian hypothesis of gravitational attraction between all bodies); the latter are those which postulate some type of hidden mechanism not open to direct inspection in order to account for certain phenomena (*e.g.*, the hypothesis of the atomic constitution of matter).

In logic and mathematics the term hypothesis is also used for the data of a given problem (as in geometry), as well as for the antecedent clause of a conditional statement (for example, the first clause in the statement "If 6 is an even number, then it is divisible by 2").

Hyrax (*hī'răks*), a genus of small mammals native to Asia and Africa, somewhat similar in size and appearance to the rabbit. The body is covered with fur, the tail is short, and the snout or muffle is split like that in the rodents. A species called *klipdas* is native to South Africa, where it is also known as the Cape hyrax. These animals have the pads of the feet so arranged as to give a slight suction, and so are able to climb about smooth rock and the lower limbs of trees with much agility. A species native to Syria is called *cony* in the Bible and is known locally as the *daman*. The flesh is eaten by the Arabs and others, but it is not considered very palatable by Europeans. The skin is used in making cloaks and other wearing apparel.

Hyssop (*hĭs'sŭp*), a genus of labiate plants native to Southern Europe and Asia, but now cultivated extensively in gardens. They are perennial, shrubby plants, grow to a height of 2 ft., flower from June to September, and have an agreeable aromatic odor. They yield a kind of camphor, but are cultivated more largely for their beautiful blue flowers. Many species are grown in flower gardens, some of which are mentioned in both the Old and New Testaments. They are spoken of as the symbol of spiritual purification from sin.

Hysteria (*hĭs-tĕ'rĭ-ä*), an affection of the nervous system, in which the excitability is exaggerated and the will power is reduced or staggered correspondingly. The chief symptoms are a choking sensation, uncontrollable laughing and crying, and convulsive and irregular movements of the head and limbs. Neuralgia, anesthesia, hyperesthesia, deafness, blindness, loss of the sense of taste, partial and complete paralysis, etc., may result from hysteria. Hysteria is often due to worry, overwork, irregular habits, and great emotional excitement. Heredity may also be a cause of hysteria. Though formerly regarded as of little consequence, it often takes the form of a severe illness. Psychoanalytical treatment, hypnosis and, in severe cases, so-called shock treatment, recently introduced, are effective therapeutics.

I (*ī*), the third vowel and ninth letter of the English alphabet. In the early Phoenician and Greek alphabets, from which it was derived, it was formed somewhat like the letter z. Up to a comparatively late date *I* and *J* were regarded as one character, and in dictionaries the words beginning with these letters were classed together. It has two principal sounds, the long and short. The *long sound* is represented in such words as *find, bind, wind* and the *short sound,* in *bill, pin, fill.* In addition to these, it has three minor sounds, as in *dirk, intrigue,* and the consonantal sound of *y,* when followed by a vowel, as in *billion* and *Christian. I* is the pronoun by which a speaker or writer denotes himself, being the nominative case of the first personal pronoun of the singular number.

Iambus (*ī-ăm'bŭs*), a foot or measure used in poetry consisting of one short and one long syllable (˘ –). The iambic verse forms most commonly used by the Greeks were iambic dimeter, composed of lines of two iambi, iambic trimeter (three), and iambic pentameter (five). A verse composed wholly or partly of iambi is called iambic. In the modern Alexandrine (*q.v.*), other feet are substituted for some of the iambi.

Iasi (*yäsh*), a city in Rumania. See *Jassy.*

Ibadan (*ē-bä'dän*), an important town of Nigeria in Western Africa, in the Yoruba country, 75 m. N. of the Bight of Benin. The town is surrounded by walls and is connected with Lagos by a railway. It contains a system of Mohammedan schools, and numerous mosques and native temples. The trade is important, especially in cotton, livestock, clothing, and fruits. Population, *ca.* 300,000.

Ibagué (*ē-vä-gā'*), capital of the department of Tolima, Colombia, 60 m. W. of Bogotá. It is situated on a fertile plain (alt. 4,300 ft.) and has a healthful climate. The surrounding country is rich in silver and sulfur mines. Ibagué was founded in 1550. Population (est., 1947), 84,840.

Ibajay (*ē-vä'hī*), a town of the Philippines, on the island of Panay, about 60 m. N.W. of Cápiz. It has considerable trade in rice, tobacco, and fruit. Population, *ca.* 22,700.

Ibarra (*ē-bär'rä*), capital of the department of Imbabura, Ecuador, 60 m. N.E. of Quito and 7,300 ft. above sea level. The surrounding region is volcanic and the city has frequently suffered from earthquakes. The chief industries are cotton and woolen mills, machine shops, and brickyards. Ibarra was founded in 1597. Population, *ca.* 15,000.

Iberia (*ī-bēr'ĭ-ä*), a peninsula of southwestern Europe, comprising Spain and Portugal (*qq.v.*). The name, which dates back to classical times, was probably derived from the Iberus or Ebro River.

Iberville (*ē-bär-vēl'*), PIERRE LE MOYNE, SIEUR D', soldier and explorer, born at Montreal, Canada, July 20, 1661; died in Havana, Cuba, July 9, 1706. He entered the French navy at an early age, but later studied military tactics. In 1686 he conducted an expedition from Ottawa to James Bay, where he captured Ft. Nelson from the English. He took part in the destruction of Schenectady in 1690 and soon after destroyed St. John and other possessions of the British in Newfoundland. He gained several victories in Hudson Bay in 1697 and two years later took possession of Louisiana, where he fortified Biloxi. In 1700 he ascended the Mississippi River and later established a settlement near Mobile. The province

IBN SAUD OF SAUDI ARABIA
The first king of the Arab country is shown conferring (1946) with Farouk, then king of Egypt

of Louisiana, founded by Iberville, remained a French possession until 1803, when the territory was purchased by the U.S.

Ibex (*ī'bĕks*), the name of several species of wild goat, native to Asia, North Africa, and Europe. The ibex lives in mountainous country, close to the snow line. It is very agile and sure-footed, and some species leap from crag to crag in rocky and hazardous terrain. Its senses of sight, hearing, and smell are acute. The coat of shaggy, long hair is yellowish-brown in color. The horns may measure up to 58 in., growing close together on top of the head and sweeping back in a wide curve. The *Siberian ibex* is largely native to the mountains of central Asia. The *Abyssinian ibex* is a stocky breed, with short, thick horns. The *Nubian ibex,* found in Egypt, Arabia, and Palestine, has longer, slender horns. The *Chetan ibex,* or *pasang,* tends to roam in herds, in distinction to the more solitary habits of other species. It is considered the ancestor of the domestic goat. The *Alpine ibex* is now extinct in the wild state, although some live under protection in the Italian Alps.

Ibicui (*ē-vē-kwē'*) or IBICUY, a river in Brazil, in the state of Rio Grande do Sul. It rises north of Santa Maria and flows *ca.* 400 m. west to the Uruguay River at the border of Argentina.

Ibidem (*ī-bī'dĕm*), Latin, meaning "in the same place," adverb used (generally in abbreviated form—"ib." or "ibid.") in giving literary references, meaning in the same book, or in the same passage.

Ibis (*ī'bĭs*), a genus of wading birds allied to the storks, herons, and spoonbills. The species, of which there are more than 25, are widely distributed in North America, Eurasia, Africa, and the islands of the seas. The *red,* or *scarlet, ibis* is native to tropical and subtropical America and is common to the Amazon region of South America. Its brilliant scarlet plumage is accentuated by bluish-black wing tips. This species tends to fly in symmetrical formations and gathers in flocks numbering in the hundreds. The *white ibis,* its white plumage marked by greenish black wing tips, is found in the southern U.S., particularly Florida. The *glossy ibis,* of dark green plumage, is found in Europe and sometimes in Florida. The *sacred ibis,* found throughout Africa, has white body plumage, lacy black tail plumes, and unfeathered black back and head. It was worshipped by the ancient Egyptians, who depicted Thoth, god of wisdom, as having the head of an ibis. They bred and cared for this bird in their temples and embalmed the body after death. The so-called *wood ibis,* found in the southern U.S., is actually a member of the stork family.

Ibn Ezra (*ĭb'n ĕz'rä*) or ABEN EZRA, ABRAHAM BEN MEIR, Jewish scholar, born in Toledo, Spain, in 1092; died 1167. A notable linguist, he was a master of Hebrew, Arabic, and Aramaic. He is best known for his commentaries on the Bible, which are the first to make a distinction between reason and faith in Biblical criticism. He was the author of works on mathematics, astronomy, medicine, philosophy, and grammar, as well as of poems of high merit. Ibn Ezra was the inspiration of Robert Browning's "Rabbi Ben Ezra."

Ibn-Gabirol (*ĭb'n-gä'bē-rôl*), SOLOMON BEN JUDAH, also called AVICEBRON, Jewish poet and philosopher, born in Málaga, Spain, *ca.* 1021; died in Valencia, *ca.* 1058. His most notable work, "The Well of Life," reveals a Platonic and rationalistic approach to philosophy and was of significant influence on the early scholastic school. Other works include "Choice of Pearls," a collection of Arabic aphorisms; and "Introduction to the Improvement of the Qualities of the Soul," a work on ethics. Ibn-Gabirol was also noted as a poet, the first to popularize the use of Arabic meters in Hebrew poetry.

Ibn Saud (*ĭb'n sōō-ōōd'*), ABDUL-AZIZ, king of Saudi Arabia, born *ca.* 1880 in Riyadh, Arabia; died there, Nov. 1, 1953. The son of Abd-el-Rahman, sultan of Nejd and leader of the strict Wahabi sect of Mohammedanism, Ibn Saud succeeded his father in 1901. In the same year he took Riyadh, and from 1906 to 1914 he consolidated his rule over Nejd, arousing nationalist sentiments in his people and making the Wahabi religion dominant among them. Further conquests (1919-22) added other Arabian regions to his domain, and in 1924 Ibn Saud waged war against Husein, king of the Hejaz, which he conquered in the following year. Recognized by Great Britain as king of Nejd and Hejaz in 1927, Ibn Saud renamed his realm Saudi Arabia in

1932. The discovery of oil in 1938 increased the importance of the new state in international politics. In January 1945 Ibn Saud agreed to participate with other Moslem states in the Pan-Arab Federation (Arab League, *q.v.*), founded for the purpose of political, cultural, and economic cooperation and having as a basic tenet support of the Arabs in Palestine (*q.v.*). He was succeeded by his son SAUD IBN ABDUL-AZIZ (1902-).

Ibrahim Pasha (*ĭb-rä-hēm′ pä-shä′*), general, viceroy of Egypt, born in Kavala, Thrace, in 1789; died in Cairo, Egypt, Nov. 9, 1848. The son or adopted son of Mehemet Ali (*q.v.*), he joined the Egyptian army at an early age and won victories against the rebel tribes of Upper Egypt and the Mamelukes in Nubia. He defeated (1816-18) the Wahabis of Arabia and, acting for Turkey, crushed an uprising (1824-27) of the Greeks. When France, Russia, and England intervened and defeated the Turkish and Egyptian fleet in 1827, Ibrahim was recalled to Egypt. In 1831, after his father had fallen out with the Turkish government, he defeated its forces along the coast of Syria, taking Acre, Damascus, Homs, and Konia in the following year. In 1839 war broke out again and Ibrahim won new victories over the Turks in Syria, but after British intervention Syria was restored to Turkey in 1841. A few months before his death in 1848 Ibrahim succeeded his father as regent. His son, ISMAIL PASHA (1830-94) was viceroy (1863-67) and the first khedive of Egypt (1867-79).

Ibsen (*ĭb′s'n*), HENRIK, dramatist and poet, born in Skien, Norway, March 20, 1828; died in Christiania (now Oslo), May 23, 1906. His father failed in business when Ibsen was a child, and at 15 the boy was apprenticed to a druggist. Finding the work distasteful, he consoled himself by reading, particularly poetry, and soon he began writing poems himself. In 1850 he entered the Univ. of Christiania, and in the same year his first play—"Catalina," a tragedy in blank verse—was published. This was followed immediately by "Viking's Barrow," and in 1851 he was named theater-poet at the Bergen theater, newly established by the violinist Ole Bull. In his six years in this post Ibsen produced plays prolifically; among them were "St. John's Night" (1853), "Lady Inger of Ostrat" (1855), "The Banquet of Solhaug" (1856), and "Olaf Liljekrans" (1857).

In 1857 Ibsen returned to Christiania and married Susanna Thoresen. For his own theater there he wrote the first plays marked with the stamp of the mature Ibsen—"The Vikings of Helgeland" (1858) and "Love's Comedy" (1862). The latter, which was the initial statement of his lifelong concern with the right of the individual personality to self-expression, evoked a storm of protest. His next work, written for the more successful opposition theater, was "The Pretenders" (1864), which enjoyed a large popular success.

In the meantime Ibsen had applied to the Norwegian government for a poet's pension, customarily awarded to notable literary personages. When his application was rejected, he went abroad in a kind of self-imposed exile. To this period belong the two great and last poetic dramas, "Brand" (1866) and "Peer Gynt" (1867). After the publication of "Brand," the pension was granted, but Ibsen remained abroad, living first in Dresden and later in Munich. Now began the succession of prose dramas that perhaps most emphatically established Ibsen's place among writers for the theater. "The League of Youth" (1869), the first prose play, was a political satire that caused considerable controversy. Next came the vast historical drama, "Emperor and Galilean" (1873), a penetrating study of Julian the Apostate. Ibsen's growing concern with society and its impact on the individual, as well as his virtual obsession with the importance of the affirmation of love in human life, were evidenced in the succession of compelling plays that followed: "The Pillars of Society" (1877), "A Doll's House" (1879), "Ghosts" (1881), "An Enemy of the People" (1882), "The Wild Duck" (1884), "Rosmersholm" (1886), "The Lady from the Sea" (1888), "Hedda Gabler" (1890), "Master Builder" (1892), "Little Eyolf" (1894), "John Gabriel Borkman" (1896), and "When We Dead Awaken" (1899). In 1891 Ibsen returned to Christiania, where he spent his final years, the last four of which saw him in complete physical and mental collapse.

Ibsen's influence on the theater was significant during his lifetime and has continued since. His work deals with social problems—the structure of society, the individualism of women—which are contemporary and vital to all ages.

HENRIK IBSEN

Ibsen's approach sometimes takes the form of a merely naturalistic drama; at other times he utilizes satire, and at others—particularly in his later works—he uses symbolism to attack realistic problems. All strata of society come under examination, and it is not only the situation of a particular character that holds the audience, but the deeper validity of the idea expressed through development of that situation. Not only has Ibsen influenced the work of dramatists who followed him. His own plays have retained their quality of immediacy of message and have continued to receive frequent production at all levels of American theatrical activity.

Ibycus (*ib'i kŭs*), a legendary lyric poet of ancient Greece, born at Rhegium in the 6th century B.C. He lived for some time at the court of Polycrates, a legendary tyrant of Samos, and his death occurred near Corinth, where he was attacked and fatally wounded by robbers. It is said that he cried out before dying that his death would be avenged by a flock of cranes that were flying overhead. Shortly after, one of the murderers, while attending a theatrical performance at Corinth, seeing a flock of cranes flying, cried out, "Behold the avengers of Ibycus," and from this evidence the criminals were discovered and punished. Schiller recites the story of his life in "The Cranes of Ibycus."

Ica (*ē'ka*), or PUTUMAYO, a river of South America, rises in the Andes of Colombia, and joins the Amazon near São Antonio, in Brazil. The general course is toward the southeast. It is about 1,000 m. long and the greater part of this distance is navigable. The valley of the Ica is covered with fine forests and the region is sparsely settled.

Icarians (*i kâr'i ănz*), members of a Communist group, founded by Etienne Cabet (1788–1856) in whose book, "Voyage en Icarie" (1840), are set forth the ideals of the society of Icarians. Under his direction, several unsuccessful attempts were made to establish a settlement in 1848 in Texas, and later in Illinois and Iowa. Only a few of the colonists carried on the principles of the group, eventually founding Icaria Speranza in California.

Ice (*īs*), the name of water when it is congealed or frozen into a solid mass. This occurs in case the temperature is reduced to 32° F., when a condition is reached which is designated as zero on the Réaumur and Centigrade scales. At 39.2° F. water begins to expand as the cooling process goes on, and continues until 32° is reached. Thus a given quantity of ice is lighter than an equal quantity of water, which causes ice to float. It is due to this fact that the lakes and oceans do not freeze solid, since the protective covering formed by ice on the surface prevents the escape of heat stored in the water. If it were not for this phenomenon, the solid masses of ice formed in large bodies of water would not be melted by the heat of a tropical sun in the warmer seasons of the year, and at least three-fourths of the earth would be incapable of sustaining its present life.

The freezing point of water is affected by various circumstances, such as pressure and ingredients held in solution by liquids. With an increase of pressure on a liquid the freezing point is lowered, and it is raised by a removal of pressure. Bodies of water holding salts in solution, as is the case in the ocean and many lakes, freeze at a lower temperature than pure water. The freezing point of sea water is about 28° F., varying somewhat with its saline ingredients and the atmospheric pressure. Water at perfect rest and not containing dust particles requires a lower temperature to be congealed into ice, since in that state it more effectually retains its latent heat, but it is influenced to some extent by the depth. In freezing, the saline matters are separated from the salty water, hence fresh and pure water may be procured by melting the ice.

The formation of ice has a marked effect in disintegrating rocks and stones. This is due to the circumstances that water fills the cavities and pores, and the expansion which results in freezing causes particles or even large pieces to break off the main body. The largest masses of ice occur in nature in the form of glaciers and icebergs, and in their clefts the deep blue of pure ice is most beautiful.

Ice formed in nature and by artificial processes is an important article of commerce, and is transported in large quantities for general consumption.

MANUFACTURE OF ICE. The manufacture of ice is an important industry. This enterprise began to develop about 1850, but the industry assumed extensive proportions only within recent years. The process involves lowering the temperature below the freezing point by permitting pure ammonia liquid to expand within iron pipes that are coiled in tanks filled with calcium chloride solution, from which the heat is drawn by the ammonia in evaporating. The machines consist generally of a congealer, in which the evaporization of the ammonia takes place; a pump for aspirating the gas as it forms in the vaporator, and a condenser. In the condenser the gas is compressed by a pump, the liquefaction being aided by a condensing stream of cold water, and by this means the ammonia is restored to its original state, being used successively for the same purpose. Cans filled with pure water are set into the brine tanks and there are frozen. The cans contain from 100 to 300 pounds of ice. Another plan is to produce the ice in plates or sheets, in which form it is generally known as plate ice. It is obtained in this form from pure water in sheets about 8 by 20 ft. in size, and with a thickness of 10 to

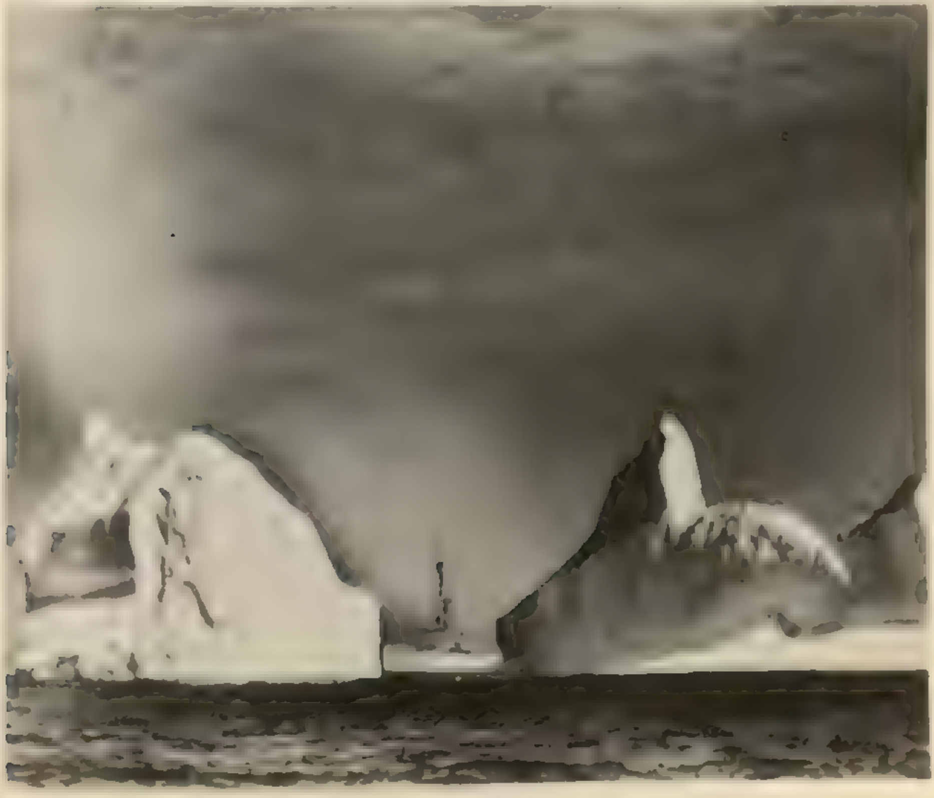
as ice. When [illegible] and reduced to a comparatively low temperature, the gases are [illegible] suitable for transportation. [illegible] temperature. In some [illegible] Other gases used are [illegible] Scientists have perfected [illegible] for the production of [illegible] Dry ice is used for [illegible] and is of increasing use in [illegible] transportation. Per pound, dry ice produces a lower temperature and [illegible] See also *Refrigeration*; *Water*.

Iceberg [illegible], a large mass of ice, usually floating in the ocean, but sometimes lodged on the shores or on [illegible] from glaciers that move through [illegible] when they reach the shore of the sea, large masses [illegible] into the ocean, thus forming icebergs. They are seen both in the northern and southern seas, in latitudes between [illegible] as we proceed toward the poles, finally merging into the frozen sea which [illegible] the polar regions. Icebergs rarely drift nearer the Equator than [illegible] N. and [illegible] S., owing to their melting in the warmer regions. [illegible] sometimes attaining a circumference of several miles and rising to a height of [illegible] However, only about one-ninth of their volume is seen above the surface. The bluish-green tint of the solid ice masses is very beautiful, and in their [illegible] fresh water often occurs from the melting ice. In some regions they are carried by winds and ocean currents into warmer seas, where they give rise to fogs, but melt rapidly. Large masses of rocks and earth are carried by them, and they [illegible] transport seeds of plants and [illegible] Ice which covers a large portion of the sea is called an *ice field*; a small field is [illegible] floe, and a field which is broken up forms an *ice pack*. Field ice covers a vast portion of the sea in winter but is broken up on the approach of summer.

ICEBERG

The [illegible] are [illegible] below the surface.

Official Coast Guard Photo



Ice Boating (*īs' bōt-ĭng*), or ICE YACHTING, the amusement or sport of sailing yachts over ice. The first iceboat was built in America in 1790. A modern ice yacht consists of a body composed of two pieces or one solid stick of wood. Joined to the body at right angles is the running plank, supported by two principal runners. The third runner is placed in the rear and is operated as a rudder by means of a tiller. From the center of the boat rises the mast which supports the two sails. In sailing the boat, the sails are trimmed flat. The closest the boat can get to the wind is 30 degrees. Its greatest speed is attained at 120 degrees from the wind, at which point the speed of the yacht is twice that of the wind. Ice boating as a sport reached its highest development in the U.S. and is practiced in few other countries.

Icebreaker (*īs'brāk'ĕr*), a vessel equipped with a sharply inclined bow, suitable for making and maintaining channels through field ice. In many seaports in northern countries—such as Russia, Canada, and the Great Lakes region of the U.S.—all water-borne traffic would be suspended in winter except for the use of icebreakers. The first notable icebreaker was the *Pilot* (1870). It was used to maintain communication between Kronstadt and St. Petersburg. The famous Russian ice breaker *Ermak* or *Yermak*, built in England in 1898, was designed from plans by Adm. Makarov. The vessel was intended for use in polar exploration and for forcing a channel through the Baltic for shipping.

ICEBREAKER

Courtesy U. S. Coast Guard

Its powerful engine enables the icebreaker to charge into the ice at full speed. The sides of the vessel are so shaped that should it get caught in the ice, it is not crushed, but rather is forced up. When the bow meets the edge of the ice, the vessel rises upon the ice, and the weight of the "breaker" causes the ice to collapse. In especially thick ice, continual charging and retiring is the only way to make progress. A well-built icebreaker forces its way through 2 to 12 ft. of ice.

Ice Hockey (*īs' hŏk'ĭ*). See *Hockey*.

Iceland (*īs'lănd*), an island of volcanic origin, situated in the North Atlantic Ocean, about 230 m. S.E. of Greenland and 600 m. W. of Norway. The area is 39,709 sq. m. It is 300 m. long from east to west, with a central breadth of 200 m. Its coast lines are indented by great bays or fiords, and adjacent to it are many small islands. The surface is diversified by several mountain chains, a number of which contain active volcanoes. There are numerous lakes and many streams penetrate through the valleys. The Thjorsa, Skja Danda, Jökulsa, and Axarfirdi are the most important rivers. Geysers are found in many localities, but are most numerous in the southwestern part, near Reykjavik. Sulphur is the most abundant mineral, but it has workable deposits of rock crystal, chalcedony, refracting spar, and brown coal.

The climate of Iceland is extremely cold, but mild considering the latitude. The summers are short and damp. Vegetation is sparse and it is found mostly along the coast. The timber is limited to several stunted species, the principal tree being the birch. Other plants include the willow, bilberry, and heath. Nutritious grasses of different kinds mingle with the shrubs and afford good grazing for sheep. The manufactures are largely of a domestic nature, such as earthenware, clothing, utensils, leather, and canned fish. The principal imports include breadstuffs, timber, hardware, clothing, sugar, and tobacco. Among the chief productions are cattle, sheep, potatoes, radishes, vegetables, horses, and ponies. The exports include sealskins, sulphur, wool, cattle, fish, eiderdown, etc.

The inhabitants are of Scandinavian origin and speak the oldest form of the Scandinavian group of languages. Their literature is extensive. It has been enriched by translations from many master productions of German and English writers. The *Sagas* are histories and works of a romantic character, and have been translated into various languages. Practically all the people belong to the Lutheran Church. The educational institutions include elementary schools, several colleges, and a university at Reykjavik, the capital and most important seaport of Iceland.

The history of Iceland begins with the end of the 8th century, when scattered settlements were

Courtesy Consulate General of Iceland, N. Y.

MAIN SQUARE OF REYKJAVIK, CAPITAL OF ICELAND

made by Irish emigrants. Shortly after, people immigrated from the Scandinavian countries. In 870 Harold Haarfager by his arbitrary rule caused many Norwegians to emigrate to Iceland. By 925 the coast regions were heavily populated and an aristocratic republic was formed, which maintained itself through several centuries. In 981 Christianity was introduced, schools were established, and considerable advancement was made in agriculture, commerce, and other civilized arts. At that time Iceland attained its highest degree of prosperity. Within that period Greenland was discovered, in 983, and North America was visited under Leif Ericsson about 1001. Magnus VI of Norway annexed Iceland to his dominion in 1264. In 1380 it was made a territory of Denmark. In 1918, Denmark acknowledged Iceland as a sovereign state, tied to Denmark only in the sense that the Danish king was also the king of Iceland.

In June 1944, Iceland exercised her right to sever the Act of Union with Denmark and thus became an independent republic with no obligations of allegiance to the King of Denmark. Sveinn Björnsson was elected the first president with the unique term of office of one year. The constitution specified that the first president should serve for only one year, but that the term of office of his successors should be four years. The Althing or parliament is divided into two houses, an upper and lower house.

Occupied by British troops in May 1940, Iceland was garrisoned by U.S. forces about a year later in order to prevent a German invasion during World War II. In June 1944, the republic became a member of the United Nations (*q.v.*). In 1948 Iceland became a participant in the European Recovery Program (*q.v.*), and in 1949 signed the North Atlantic Treaty (*q.v.*). Population, *ca.* 120,000.

Iceland Moss, the name of several species of lichens found in cold climates, so named from its wide distribution in Iceland. It is widely distributed in Northern Europe, especially in Norway, and is found on the upper parts of many elevated mountains. Iceland moss is gathered as a food by the inhabitants of Iceland and Lapland, and is either boiled with milk or is dried and used in making bread. To render it palatable and remove a bitter taste, it is necessary to steep it in water. It is important in the manufacture of paper sizing, in dressing warp in weaving, and as a diet for those suffering from pulmonary diseases.

Iceland Spar, a transparent variety of calcite, so named from the fact that the best specimens are obtained from Iceland. Being transparent and having a double refraction property, it is employed in optical instruments.

Ice Plant, the name of an annual herb native to Africa and Europe, so named because the leaves are covered with vesicles that appear like crystals of ice. Several hundred species have been described, all of them native to moderately warm climates. A few species have been introduced in California, where they are cultivated for their flowers. The natives of the Madeira Islands use the seeds as food, and the ashes of the plant yield carbonate of soda, which is useful in making glass and soap.

Ichneumon (*ĭk-nū'mŏn*), a genus of carnivorous animals which belong to the civet family. They are noted for their destruction of rats, mice, reptiles, and insects. They are especially

fond of the eggs of crocodiles, on account of which they were held sacred among the Egyptians. The best known ichneumon is found in Egypt and a smaller kind is native to India. The Egyptian ichneumon is somewhat larger than a cat. This species is popularly known as *Pharaoh's rat,* while the Indian ichneumon is now commonly called *mongoose.*

Ichneumon Fly, an insect of a large group of *Hymenoptera,* including about 5,000 known species. They deposit their eggs either on the bodies or within the eggs of other insects and spiders. The larvae devour the eggs, insects, or animals, either mature or immature, in which they are developed. When the insect reaches maturity, the worm on which it fed expires from exhaustion, and the fly begins to feed on the juices of plants. In this way they are of vast benefit to man, since they destroy grubs, caterpillars, the Hessian fly, and other pests.

Ichnology (*ĭk-nŏl'ô-jĭ*), the branch of science which treats of fossil imprints. The rocks bearing fossil footprints or other impressions are found largely in deposits which were in the form of mud at the time imprints were made, but many occur in sandstone. The Jura-Trias sandstones of North America contain many fossil remains. See *Fossils.*

Ichthyology (*ĭk-thĭ-ŏl'ô-jĭ*), the branch of zoology that treats of fishes. Aristotle is the most eminent ancient authority on this science, and is practically the only writer of antiquity to furnish data of value regarding fishes, their habits, and their culture. Modern treatises on ichthyology date from the middle of the 16th century. Among the most eminent writers are Max-Müller, Agassiz, Cuvier, Owen, and Pierre Belon (1518-64). See *Fish Culture.*

Ichthyosaurus (*ĭk'thĭ-ô-są'rŭs*), a remarkable fossil reptile which inhabited the sea in the period when the secondary strata were deposited. The form was somewhat like that of the porpoise. It had four paddlelike limbs, an enormous head, a long tail, and broad vertebrae, the last mentioned resembling those of fishes. Fossil remains of this animal occur from the lower Lias to the Chalk period, but they are most numerous in the Lias Oölite. More than 30 species have been discovered, some resembling the gavial of the Ganges and others the common crocodile. They are represented in the deposits of Australia, Europe, Asia, and South America. Only one species, the Baptanodon, is found in North America. See also *Fossils; Geology.*

ICHTHYOSAURUS AND YOUNG

Courtesy American Museum of Natural History, N. Y

Ickes (*ĭk'ęs*), HAROLD L., cabinet member, born in Frankstown Township, Blair County, Pa., March 15, 1874; died in Washington, D.C., Feb. 3, 1952. He was graduated from Chicago Univ. in 1897 and became a newspaper reporter. In 1907 he earned his law degree and immediately became associated with reform politics in Chicago. President F.D. Roosevelt called him to his cabinet as Secretary of the Interior in 1933, a post

HAROLD ICKES

in which he continued under President Truman until February 1946, when he resigned. From 1933-39 he was administrator of public works, and petroleum administrator, 1933-45.

Ickes' resignation as Secretary of the Interior resulted from a dispute with President Truman regarding the nomination of Edwin W. Pauley, a California oil man, for the position of Undersecretary of the Navy. Ickes, with others, stoutly opposed the appointment on the grounds that Pauley's business interests were too closely associated with the post. Ickes then became a columnist for the *New York Post* Syndicate and was also named executive chairman of the Independent Citizens Committee of the Arts, Sciences, and Professions in New York.

On Nov. 11, 1946, he resigned from this group, stating that he did not want to be bound by a group judgment with which "I may not fully be in accord."

Among his writings are: "The New Democracy" and "America's House of Lords," as well as his "Autobiography of a Curmudgeon."

Iconoclast (*ī-kŏn'ŏ-klăst*), the name given in the 8th century to one who supported a movement against the religious use of images. Those who worshiped images were called *iconolaters*, and they became particularly numerous in the Eastern Church. At first, images of bishops and martyrs were used to commemorate their lives, but later they were worshiped, and incense was offered to them on altars. Emperor Leo III of Byzantium promulgated an order against the worship of images and directed that pictures and other movable objects should be placed sufficiently high so as to prevent people from kissing them and showing other marks of devotion. In 842 a council at Constantinople sanctioned the worship of images in the Greek Church, and this order was subsequently affirmed by other councils. In the Western Church image worship is not practiced. Iconoclasm became quite general in some sections of Europe during the Reformation, when many sacred statues and images were destroyed. It reached its height in England during the time of Cromwell.

Ictinus (*ĭk-tī'nŭs*), an architect of ancient Greece, who flourished in the time of Pericles. He designed and, in connection with Callicrates, built the Parthenon at Athens, which was finished in 438 B.C. Subsequently he built the Temple of Apollo Epicurius near Phigalia in Arcadia and a temple at Eleusis, but the latter was destroyed by Alaric A.D. 396. His architecture was chiefly in the Doric order.

Ida (*ī'dą*), the ancient name of two elevations, one in Asia Minor, the other on Crete. Ida, the modern Kazdaği, is a mountain range in Turkey, near the site of ancient Troy. The highest peak is Mt. Gargarus (5,800 ft.). In Greek mythology the gods watched the battles of the Trojan War from vantage points in the Ida Mts. The highest peak (8,195 ft.) on the island of Crete is now known as Psiloriti (Greek, Hypseloreitēs). It is associated in Greek mythology with Zeus.

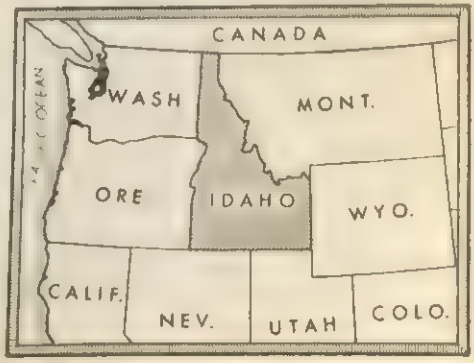
Idaho (*ī'dą-hō*), a state in the Mountain section of the U.S., having within its borders one of the most varied topographies in North America. It is a land of lofty and jagged mountain peaks, rugged canyons, and rivers rushing through cataracts and rapids and churning through deep gorges; as well as a land of lava beds, sagebrush barrens, upland meadows, lakes, valleys, and towering forests. Rich in its diversity of resources, Idaho is a land of

magnificent natural scenery and of industrial opportunity.

Idaho has the most irregular boundaries of any state, because it was the last state claimed from the Oregon Territory, after the boundaries of all the others had been established. It is bounded on the N. by Montana and British Columbia, on the E. by Montana and Wyoming, on the S. by Utah and Nevada, and on the W. by Oregon and Washington. It ranks 13th in size among the states and 43rd in population, according to the 1960 Decennial Census of Population (the District of Columbia is included in both rankings). The origin of the state's name has been the subject of intensive but fruitless research, although a large body of literature (mostly fiction) has been written on it. The state nickname is "Gem of the Mountains" (the meaning which was attributed to the word Idaho by some of its early proponents), or simply the "Gem State."

Geography

This curiously shaped state comprises three dissimilar geographical, industrial, and cultural areas: north, southeast, and southwest. The Salmon River, or "River of No Return," rises in



Location	Between 111°3' and 117°15' W. long. and 42° and 49° N. lat.
Area	83,557 sq. m.
Land	82,708 sq. m.
Inland water	849 sq. m.
Greatest extent:	
North to south	483.5 m.
East to west	310 m.
Population (1960)	667,191
Capital city	Boise
Highest point	Mt. Borah (12,662 ft.)
Lowest point	Snake River Valley (720 ft.)
Admitted to the Union (43rd state)	1890
Song	"Here We Have Idaho," words by McKinley Helm, music by Sallie Hume-Douglas
Flower	Syringa
Bird	Mountain bluebird
Motto	*Esto Perpetua* (Latin, meaning "Endure Forever")
Flag	See color plate in Vol. XI

the snowy heights of the Sawtooth Range, flows north, then west, then northwest, joining the Snake River on the Oregon border. Flowing through rugged mountains, deep gorges, and dense timber, it so effectually separates northern Idaho from the southern plains that wide circuits into adjoining states must be made by rail to get from one section to another. In the central part of the state is the Primitive Area (established 1931), comprising 1,500,000 acres of sharp ridges in the Salmon River Mts., as wild as any area in the mid-continental U.S. This roadless forest expanse provides game for the country's finest hunting; it is not open to settlement. Another major river, the Snake River, rises northeast of the Teton Range in Wyoming and cuts across southern Idaho in a wide arc, turning northward through a rich valley and the Snake River Canyon to form about a third of the state's western boundary. At Lewiston the river turns west into Washington and drains into the Columbia River. The Snake, with its tributaries, drains almost all of southern and central Idaho, has a greater annual flow than either the Colorado River or the Rio Grande, and has a drainage basin ninth in size in the U.S. Shoshone Falls (212 ft.), one of the Snake's cataracts, is higher than Niagara. In Hell's Canyon, the Snake flows through a 7,900-ft. gorge, exceeding even Grand Canyon in depth.

In northern Idaho is the upper panhandle, a land of dense forests, high valleys, and raging rivers, broken by the Cabinet and Coeur d'Alene Mts. When this great wheat land was crossed by the Great Northern R.R. in 1892, James J. Hill (*q.v.*) ridiculed the country, but he lived to see it develop. In the northern panhandle are the Kootenai River and Clark Fork of the Columbia River, which empties into Pend Oreille Lake. The lake, 180 sq. m. in area, yields the world's largest trout, the Kamloops rainbow. Farther south, the St. Joe and Coeur d'Alene rivers flow into Lake Coeur d'Alene. The forests of northern Idaho are watered by frequent rains and by snows 10 to 12 ft. deep. Warm, dry winds (chinooks) blowing from the west at intervals melt the drifts into sudden torrents. The ten counties of the panhandle include much of the state's mineral wealth and grow about 60 per cent of its wheat.

West of a line running south from the Salmon River through Sun Valley to Twin Falls are the 16 counties of southwestern Idaho. The dividing line is formed by the Sawtooth Mts., Idaho's best-known range. On the slopes from the outskirts of Boise to these mountain heights are the rolling pastures for the growing sheep industry. Just north of the bend where the Snake forms the Oregon boundary, three smaller rivers—the Boise, Payette, and Weiser—flow into it. By 1900 the lower valleys of these rivers had developed into rich fruit and grain districts famous for cherries and apples. Boise, the present capital, was built on what was once a sagebrush plain, almost a desert, when there was no railroad within 1,800 miles. The valleys lying west of Boise to Oregon are the chief dairying sections of the state.

Southeastern Idaho contains 18 of the state's counties, about 40 per cent of its farm lands, and about 38 per cent of its wealth. There is a considerable amount of rich land in this section which proved unadaptable for farming even with irrigation. Bench lands, undulating hills and valleys with little or no water storage or distribution facilities, were made productive by *dry farming*, a method involving conservation of soil moisture and use of drought-resistant crops. About 100 m. N.E. of Twin Falls is a vast, treeless plain which includes the Craters of the Moon, 80 sq. m. of wasteland created by lava flows from ancient volcanoes.

In the arid plains of the Snake River Valley, mammoth irrigation dams impound more than 5,000,000 acre-feet of water; among them are the American Falls Reservoir and Palisades Dam, on the upper Snake River; Arrowrock Dam, Anderson Ranch Dam, and Lucky Peak Dam, across the Boise River; and Cascade Dam on the Payette River. The coordinated operation of these reservoirs provides flood control, recreational facilities, and increased agricultural production. In 1950 Idaho was the third most heavily irrigated state.

South central Idaho boasts one of the nation's most famous attractions—Sun Valley, a recreation area which features summer ice-skating on a huge shielded rink. Skiing on alpine slopes or swimming in the glass-enclosed pool make Sun Valley a favorite playground in winter as well as in summer.

Climate: Idaho's climate is generally dry and stimulating, cold in the mountains and mild in

ALLURING IDAHO

The harvesting of the potato crop (*left*) is an important undertaking in a primarily agricultural state like Idaho, which ranks second in the production of this vegetable. The White Cloud loop (*right*) of the Sawtooth Range, near Sun Valley, is one of the many scenic trails in the rugged mountains which invite the vacationist (*Union Pacific R.R. Photo*)

MORE "GEM STATE" VIEWS

Shoshone Falls (*left*), on the Snake River in southern Idaho, drop 212 ft. (*Ewing Galloway*). Calf-roping (*above*) at a rodeo (*Union Pacific R.R. Photo*)

TO BE STORED UNTIL NEEDED

River scenes like the one shown above are quite common in Idaho, which produces large quantities of lumber

the valleys. The Rocky Mts. shield the state from the severe winters of the Plains states and permit warm Pacific air to linger over the land. Even in the high mountains there are long summers and comfortable winters, but variations are created by the great differences in altitude and the location of natural hot springs. The north has a moist climate, while the south is dry.

Normal temperature, Boise	
January	27.9° F
July	72.5° F.
Annual mean	49.8° F.
Latest frost, Boise	April 23
Earliest frost, Boise	Oct. 17
Precipitation, Boise	
January	1.73 in.
July	0.24 in.
Annual	13.14 in.
Average growing season, Boise	177 days

Natural Resources

Idaho is chiefly a farming, grazing, lumbering, and mining state. Discovery of gold at Orofino Creek and in the Boise basin brought the first settlers, 1860-62. Silver and lead strikes in the 1880's brought many more miners to the Coeur d'Alene Mts., where the Bunker Hill and Sullivan mine became the largest lead producer in the U.S., and the Sunshine mine, the leading silver producer. Thus, before 1900 Idaho was essentially a mining country; 36 of 44 counties have minerals of commercial importance. In 1961 Idaho ranked second among the states in the production of lead and zinc ores and led the nation in silver production. It ranks 35th in mineral production.

One of the greatest factors in Idaho's future development is expected to be its abundant water-power resources. With 1,251,000 kw. of hydroelectric power already developed, the state's potential production is estimated at 9,000,000 kw., making it the fourth-ranking state in undeveloped water power. In 1960 Idaho's combined utilities and industrial plants (mainly hydroelectric) produced 6,315,000,000 kw. hr. of electric energy. Of importance to the state and national economy is the National Reactor Testing Station at Idaho Falls, where atomic energy generated electricity for the first time in the U.S. on Dec. 20, 1951.

The state contains about 21,000,000 acres of timber, amounting to *ca.* 95,015,000,000 bd. ft., about half of which has commercial value. One-third of this timber is in national forests, 26 per cent is privately owned, and the remainder is in the public domain (withdrawn for survey, reclamation, or classification, or used for Indian reservations). Idaho has more acreage in national forests than does any other state except Alaska.

In the north grow Douglas fir, white fir, spruce, ponderosa pine, lodgepole pine, and the western white pine, which sometimes reaches 200 ft. in height. In this region are the Lewiston and Potlatch mills, the largest white-pine lumber mills in the world. Roosevelt Grove, near Nordman, has giant red cedars 3,000 years old. The Clearwater, Kaniksu, and Coeur d'Alene national forests contain the finest stand of virgin white pine in North America. The Boise, Payette, and Weiser rivers drain uplands containing tremendous reaches of lodgepole, ponderosa, and yellow pine; larch; hemlock; and Engelmann's spruce. The U.S. Forest and Grazing services, timber protective associations, and state foresters contribute their combined efforts to fire prevention and control. Reforestation practices have produced a second timber crop now ready for harvest on cutover lands.

Idaho's Economy

At the time of the 1960 census, Idaho had an employed population of 232,858. Of this number, *ca.* 19 per cent were in agriculture, forestry, and fisheries; 14 per cent in manufacturing; 7 per cent in construction; and 2 per cent in mining. The remainder were employed in the wholesale and retail trades, in government, and in supplying various personal, professional, and other services.

There were 33,670 farms in 1959, occupying a total of 15,232,000 acres. The average farm had 452 acres, with land and buildings valued at $50,528.

Idaho is foremost in the nation in potato production, and this vegetable is its most valuable crop, with wheat running a close second. Sugar beets, dry beans, hay, barley, and fruits—particularly apples, plums, and prunes—are also important sources of income. Sales of crops normally account for a little over half of all farm marketing receipts.

Beef animals and milk are the leading sources of livestock income. Sheep and lambs—raised for meat and wool—eggs, and hogs are also important income producers. The total receipts from sales of crops and livestock amounted to $424,735,000 in 1961.

Idaho's manufacturing is based mainly on the

ANNUAL STATE EVENTS

Dog Team Derby	Feb. 22; Ashton
Winter Sports Carnival	March 1; McCall
Music Week	May; Boise
Cherry Blossom Festival	May, Lewiston; June, Emmett
Idaho Pioneer Day	June 15; Nampa, Hagermann, and other cities
Indian Dances	July; Ft. Hall Indian Reservation
Water Regatta	July 3–5; Coeur d'Alene
Rodeos	July and August; Soda Springs, Nampa, Sun Valley
Horse Show	August; Boise
Spud Day (potato harvest)	October; Shelby

state's agricultural and lumbering industries. Food products are the most important manufacture, followed by lumber and wood products, including softwoods, which are used for plywood and furniture manufacturing. Chemical and allied products are also a major source of manufacturing income. The state's value added by manufacture totaled $281,901,000 in 1961.

Idaho's mineral output was valued at $68,900,000 in 1961, comprising less than 1 per cent of the total U.S. value and placing the state 35th among the states. The principal minerals, in order

Courtesy U. S. Forest Service

CARIBOU NATIONAL FOREST, IDAHO
View in the Grand Canyon of the Snake River

of production value, were silver, lead, zinc, phosphate rock, and copper.

Transportation and Communication

Since the Oregon Trail first cut through the wilderness, Idaho has progressed steadily in transportation. In 1960 total railroad mileage was 2,685 m. The first railroad to operate in the state was the Utah and Northern R.R. (1874), now a division of the Union Pacific R.R. Other railroads include the Northern Pacific Ry., the Great Northern Ry., the Chicago, Milwaukee, St. Paul and Pacific R.R., and the Spokane International R.R. The total road mileage in 1960 was 42,435 m.; the nonsurfaced roads totaled 15,642 m. All the larger cities have airports. Idaho's only port is Lewiston, where barge traffic moves westward along the Snake and Columbia rivers. In 1961 there were 38 radio stations and six television stations. The first newspaper in the state was the *Golden Age* (1862), published in Lewiston. Today the Boise *Statesman* (1864) is the leading paper.

Population

Idaho has 44 counties. The state's 1960 census population was 667,191 (1962 est. population, 698,000), an increase of 13.3 per cent since 1950. The urban population comprised 317,097, or 47.5 per cent; the rural population was 350,094, or 52.5 per cent. Between 1950 and 1960, the urban population rose 25.6 per cent; the rural population rose 4.2 per cent. In 1960 more than 36 per cent of the urban population lived in the four largest cities—Boise City, Idaho Falls, Pocatello, and Twin Falls. Of the total 1960 population, white persons numbered 657,383; of the 9,808 nonwhites, 5,231 were Indians, 2,254 were Japanese, and 1,502 were Negroes, with the remainder including Chinese, Filipinos, and others. Idaho's native-born residents totaled 651,649; the foreign-born, 15,542. The population density in 1960 averaged 8.1 per sq. m.

The major religious bodies are the Christian Churches, International Convention (Disciples of Christ), the Church of Jesus Christ of Latter-day Saints (Mormon), the Lutheran Church in America, the Lutheran Church—Missouri Synod, The Methodist Church, the Protestant Episcopal Church in the U.S.A., the Roman Catholic Church, and The United Presbyterian Church in the U.S.A.

Chief Cities: Boise City, the capital and largest city, in the southwest, is an industrial and commercial center.

Idaho Falls, the second-largest city, in the southeast, is the site of the Atomic Energy Commission National Reactor Testing Station.

Pocatello, the third-largest city, in southeastern Idaho, is primarily a trade and transportation center.

Famous Men and Women: Borah, William E. (1865-1940), lawyer, U.S. Senator (1907-40), who served one of the longest continuous terms in the Senate.

Borglum, Gutzon (1867-1941), sculptor, whose works include the Mt. Rushmore (S.D.) portraits of four Presidents—Washington, Jefferson, Lincoln, and Theodore Roosevelt.

Fisher, Vardis (1895-), author, noted for his historical novels of the West.

Gooding, Frank R. (1859-1928), English-born governor of Idaho (1905-07); U.S. Senator (1921-28).

Pound, Ezra (Loomis), (1885-), poet, editor (1914) of the first anthology of imagist

IDAHO HISTORICAL MARKER
On the highway around Lake Pend Oreille
Photograph by Jim Parsons, Jr., Sandpoint, Idaho

Mediterranean Type—Caucasoid Race


African Negro—Negroid Race

poetry, and author of "Cantos"; he has lived principally in Europe.

Sacajawea (1784?-1812?), called the "Bird Woman," a Shoshone Indian who accompanied Lewis and Clark on their expedition.

Spalding, Henry H. (1804-74), missionary, who settled in Idaho in 1836.

Education

Education is free and compulsory for children between seven and 16. The state's board of education was established in 1913. Public-school enrollment totaled 166,660 in 1962. The enrollment in Roman Catholic parochial schools numbered 5,882. The leading state-supported institutions of higher learning include the Univ. of Idaho, Moscow, and Idaho State Univ., Pocatello. Private institutions include the Coll. of Idaho, Caldwell, and Northwest Nazarene Coll., Nampa. Among cultural facilities are the museum of the State Historical Society and the Boise Art Gallery, both in Boise.

Government

Idaho is governed under provisions of a constitution adopted in 1889, and amended frequently. The constitution gives executive authority to a governor, lieutenant governor, secretary of state, treasurer, attorney general, auditor, superintendent of public instruction, and inspector of mines, each elected for a term of four years. The legislature consists of a senate of 44 members and a house of representatives of 59 members, both houses serving for two years. The legislature meets in Boise, the capital city, for a 60-day session, beginning in January, in odd-numbered years. Idaho has the initiative and referendum, recall of all except judicial officials, and the direct primary. It was one of the first states (1896) to grant woman's suffrage. The judicial structure consists of a state supreme court, with one chief justice and four associate justices, all elected for six-year terms; 12 district courts; and county probate and municipal courts. The state is represented in the U.S. Congress by two Senators and two Representatives.

History

The earliest inhabitants of Idaho were the Bannock, Nez Percé (Sahaptin), Lemhi, Sheepeater, Shoshone, Kutenai, and Coeur d'Alene Indian tribes. Lewis and Clark were the first

MAJOR RECREATIONAL AND HISTORIC FEATURES

Name and Type	Size and Location	Points of Interest
Yellowstone National Park (established 1872)	31,488 acres in Idaho, the much larger remainder in Wyoming (U.S. 20, 191; state 1, 47)	World's greatest geyser area; waterfalls; canyons; wildlife sanctuary
Craters of the Moon National Monument (established 1924)	48,183 acres in south central Idaho, near Arco (U.S. 20, 26, 93A)	Fissure eruptions, volcanic cones, craters, caves, and lava flows
Boise National Forest (established 1908)	2,954,146 acres in southwestern Idaho, near Boise (U.S. 20, 30, 95; state 15, 16, 17, 21, 22, 52)	Ghost towns, abandoned mining operations; former Indian camps—scenes of massacres; Arrowrock, Anderson Ranch, Cascade, Deadwood, and Lucky Peak dams
Caribou National Forest (established 1907)	1,063,749 acres in southeastern Idaho, near Idaho Falls; rest in Utah and Wyoming (U.S. 91, 191, 30)	High plateaus; soda springs, streams; scenic drives; contains world's largest known phosphate reserve
Challis National Forest (established 1908)	2,467,908 acres in central Idaho, near Challis (U.S. 20, 93, 93A)	Mt. Borah (12,662 ft.), highest peak in Idaho; Salmon River headwaters; Stanley Basin; Lemhi Lost River; Sawtooth Primitive Area
Clearwater National Forest (established 1908)	1,296,751 acres in northwestern Idaho, near Lewiston (state 9, 11)	Lewis and Clark route (Lolo Trail Road); Selway-Bitterroot Wilderness Area; timber operations, spring log drive
Coeur d'Alene National Forest (established 1906)	802,277 acres in northwestern Idaho, near Coeur d'Alene (U.S. 10, 95)	Mining district; sawmills; Mullan Tree; Cataldo Mission
Kaniksu National Forest (established 1908)	1,060,012 acres in extreme north, near Sandpoint; rest in Montana and Washington (U.S. 95, 195, 10A, 2, 6)	Selkirk Mts., Pend Oreille Lake, Roosevelt Ancient Grove of cedars, 3,000 years old, wild area
Nezperce National Forest (established 1908)	2,241,071 acres in western Idaho, near Grangeville (U.S. 95; state 9, 13, 14)	Selway-Bitterroot Wilderness Area; Seven Devils Range; Hell's Canyon, Red River Hot Springs; Elk City
Payette National Forest (established 1944)	2,419,803 acres in west central Idaho, northwest of Boise (U.S. 95, 15)	Idaho Wilderness Area; Seven Devils Range; Hell's Canyon
St. Joe National Forest (established 1911)	1,091,721 acres in northwestern Idaho, near St. Maries (U.S. 95)	Bitterroot Range of Idaho-Montana divide; timber operations; canyons
Salmon National Forest (established 1906)	1,790,954 acres in eastern Idaho, near Montana border (U.S. 93; state 27, 28)	Idaho Wilderness Area; Lewis and Clark Trail; Salmon River Canyon
Sawtooth National Forest (established 1905)	1,790,356 acres in south central Idaho, near Twin Falls (U.S. 30N, 30S, 93)	Sun Valley, famous resort; Silent City of Rocks; Snake River Valley; Sawtooth Wilderness Area
Heyburn State Park (established 1908)	7,838 acres in northern Idaho, south of Coeur d'Alene (off U.S. 95, state 5)	Wooded area; lakes; fish and game
Spalding Memorial Park (established 1936)	14 acres near Lewiston (U.S. 95)	Natural park, wooded area, wildlife
Shoshone Falls	On the Snake River near Twin Falls (U.S. 30, 93)	Great falls of the Snake River (212 ft.)
Ft Hall Indian Reservation (established 1869)	In southwest Idaho, between Pocatello and Blackfoot (U.S. 26, 91, 191)	Shoshone, Bannock, and other tribes
Bird Sanctuary	Lake Lowell, near Nampa (state 72)	Many varieties of birds in natural setting

By Burton Holmes, from Ewing Galloway, N. Y.

SUN VALLEY, IDAHO

The heated, glass-enclosed pool is popular both winter and summer. In the background is part of Sawtooth Mts.

white men to come to Idaho, crossing the arid Snake River plains with the Indian woman, Sacajawea, en route to the Pacific in 1805, and returning in 1806. They were followed by fur-company representatives. The North West Co. sent David Thompson, first among the trappers, in 1809; and the Hudson's Bay Co. sent John McLoughlin. Other trappers moved in for the American Fur Co. and the Rocky Mt. Fur Co. Fort Hall, and a rival, Ft. Boise, were established in 1834. There was a high death rate among the trappers of this early period, resulting from Indian attacks, disease, and starvation. In these same years, missionaries came to Idaho. Henry H. Spalding and his wife established the Lapwai, or Clearwater, mission in 1836, where they taught the Indians agriculture, medicine, and religion. Father Pierre Jean de Smet, a Belgian Jesuit, established a Roman Catholic mission among the Coeur d'Alenes in 1842, and in 1855 there was a Mormon mission on the Lemhi River.

The discovery of gold in 1860 brought prospectors and then settlers. Lewiston developed after 1860, becoming the territory's first capital; other towns arose around the Salmon, Boise, and Owyhee rivers and in the Coeur d'Alene Mts. Idaho was first part of the Oregon Territory; in 1863 President Abraham Lincoln signed the bill making it a separate territory. As settlement progressed, the miners and settlers came into conflict with the Indians, who resisted being permanently established on the reservations that were set aside after 1869. The Nez Percés refused to give up their fertile valleys and they rebelled (1877) under Chief Joseph, a formidable diplomat and warrior. In the Bannock War of 1878, the Bannock chief, Buffalo Horn, was killed, and this revolt, too, collapsed.

Following the wave of immigration in the 1880's, sheepmen and cattlemen came into southern Idaho from Utah, Nevada, California, and Wyoming, and range wars became frequent. Farming was limited until after the passage of Federal reclamation legislation in 1894 and 1902. The Minidoka Project of 1904 was the first Federal irrigation effort in Idaho. During World War I, Idaho's lumber and silver resources were sufficiently developed to contribute to the war effort, and 22,161 men and women from the state served in the armed forces. Between the wars Sun Valley was developed, adding notably to the state's tourist trade. Idaho's timber and mineral resources—especially tungsten and antimony—figured importantly in World War II, to which Idaho sent 65,154 military personnel. In many ways Idaho is still a land relatively untouched, still awaiting the settler, the hunter, the investor, and the tourist.

See also separate entries on most of the individuals and geographical and historical subjects mentioned in this article.

Idaho Falls, a city in Idaho, seat of Bonneville County, on the Snake River, 50 m. N. of Pocatello. It is served by the Union Pacific R.R. Located in an agricultural area, it is a shipping and industrial center, and its industries include food processing. The National Reactor Testing

Station, a U.S. Atomic Energy Commission installation, is located here. Idaho Falls is the site of a temple of the Church of Jesus Christ, Latter-Day Saints, completed in 1945. The first settlement on the site (*ca.* 1860) was called Taylor's Bridge. In 1872 it was renamed Eagle Rock and in 1890 was chartered as the city of Idaho Falls. Population, 1940, 15,024; in 1950, 19,218.

Idaho, UNIVERSITY OF, a coeducational state institution of higher learning at Moscow, Idaho, established in 1889. It comprises schools of sciences, classics, agriculture, forestry, mining, law, commerce, education, engineering, and army, air, and naval sciences. It also maintains a graduate school. The library has more than 200,000 volumes and 560,000 volumes of documents. The annual student enrollment totals *ca.* 4,000, and there are some 320 members of the faculty. The value of the physical plant is about $25,000,000.

Iddesleigh (*ĭdz'lā*), STAFFORD HENRY NORTHCOTE, 1ST EARL OF, statesman, born in London, England, Oct. 27, 1818; died there, Jan. 12, 1887. He was a member of Parliament (1855-85) and served as secretary of state for India (1867-68), chancellor of the exchequer (1874-80), and secretary of foreign affairs (1886-87). In 1885 he entered the House of Lords. Among his publications is "Twenty Years of Financial Policy" (1862).

Idea (*ī-dē'ą*), any product of mental apprehension or activity considered as an object of thought. Plato regarded ideas as the eternal and immaterial forms of all material things, while Kant treated them as the primitive elements of intelligence, not as products, and modified and developed the Platonic theory of innate ideas into the modern doctrine of intuitions. See *Intuitions.*

Idealism (*ī-dē'ąl-ĭz'm*), in philosophy, the doctrine held in contradistinction to realism. According to realism, three aspects are implied and involved in any act of vision. For instance, in seeing a book there are the book, the image or apprehension of the book, and an apprehending mind, ego, or self. These three facts are dealt with in idealism as subjective, objective, and absolute. Subjective idealism holds that the book and the image are one thing and that a modification of the mind is the only fact which is perceived. According to objective idealism, the book and the mind are existences equally real or ideal, but they are regarded as manifestations of an objective fact of some kind. Absolute idealism teaches that the only thing really perceived is the idea or relation, of which the mind and the book are but two terms, and to which idea or relation they owe all the reality they have. This concept covers idealism only as a school of thought in abstract philosophy. However, the term is also used in reference to certain ethical and aesthetic attitudes in contrast to a realistic conception.

Historically, the basic development of idealism as a philosophical system is given in the writings of Plato (*q.v.*), and later in the various systems of Neo-Platonism (*q.v.*) and the philosophy of Plotinus (*q.v.*). A revival of idealism was experienced in the writings of Kant, Fichte, Schelling, and Hegel, all termed philosophers of "German idealism."

Ideography (*ĭd-ē-ŏg'rą-fī*), a method of visual communication of ideas by means of signs or symbols, which are called ideograms, or ideographs. Ideography represents the second step made by ancient peoples toward true writing. The first step, pictography, consisted of representational picture writing, in which a drawing of an eye, for instance, represented the eye and nothing more. Ideography carried pictography one step further by letting the eye also represent the sense of sight, the act of seeing, and other abstract concepts connected with it. All peoples seem to have used a circle to represent the sun; in ideography, the circle also came to represent the day, light, and heat. As ideography advanced, the symbols themselves became more abstract and developed in some systems into stylized forms bearing little relation to the object originally represented. See also *Alphabet; Cuneiform; Hieroglyphics.*

Ideology (*ĭd-ē-ŏl'ŏ-jĭ*), the sum of the social and political philosophies upon which a community or a culture is based. Ideology may be absorbed in the process of growth in a nation or a culture; or it may be imposed upon the people forcibly or by propaganda. The two major ideologies in the modern world are democracy (*q.v.*), in which the state exists to carry out the will of the people; and totalitarianism (*q.v.*), in which the people are subordinated to the state. See also *Communism; Fascism.*

Ides (*īdz*), a term applied by the Romans to the 15th day of March, May, July, and October, and to the 13th of the other months. Caesar's assassination occurred on the ides of March. "Beware the ides of March" is a famous line contained in Shakespeare's play "Julius Caesar."

Idiot (*ĭd'ĭ-ŭt*), a person of limited intelligence, or one with a high degree of mental deficiency (feeblemindedness, *q.v.*). Although the term is of Greek origin, its meaning has changed greatly. In ancient Greece an idiot was merely a private individual, in distinction from an educated man or one who took part in public affairs. The Spartans used the term to describe an ignorant or illiterate man, and it finally came to mean one who lacked the capacity to learn. Idiocy is now regarded as arrested mental development, resulting either from congenital defect or from disease. The brain may be normal in conforma-

tion, but in most cases it is abnormal. In some instances the forehead is depressed and flattened, receding backward from a point near the eyebrows; in others the back part of the head is greatly enlarged; in still others, the entire head is quite small. Other bodily malformations are frequently present.

In terms of intelligence, idiots have a mental age of less than three years, or an intelligence quotient (I.Q.) below 20. They usually cannot guard themselves against common physical dangers. They can be taught habits of cleanliness, but do not learn to bathe or dress themselves. Although they never learn to form sentences, some can form articulate words. Some are lethargic, others are restless and destructive; some have constant rhythmic movements. In rare cases, a single function, such as singing, may be astonishingly well developed (*idiot savant*). The education of idiots received attention as early as the 17th century. At present, they are most successfully handled and trained in separate institutions for the feebleminded. They constitute about 5 per cent of all mental patients.

Idol (*ī'dŏl*), a term derived from the Greek word *eidolon*, meaning an image. To those who believe in it, an image may represent a symbolic form of a god, a divine force, or spirit. The power of idols is supposedly inherent in them and connected with them physically. An amulet (*q.v.*) is basically an idol, as is a fetish (*q.v.*). The forms of the idol vary from completely abstract symbols, to animals, to enlarged and distorted parts of the human body, to more abstract representations of the whole human figure.

All primitive religions abound in idols which take one or all of the above-mentioned forms. These idols are worshiped, not as symbols, but as tangible physical objects which are inhabited by spirits. Even highly developed religions of the Near and Middle East, in Babylon and Egypt, believed that spirits dwelt in their idols. Egyptian miniature figures of human beings or animals which were buried with the dead were not idols but mere descriptive images; they were supposed to come alive to serve the dead in another world. The sometimes very fantastic images in Buddhism were accepted as symbols by highly educated believers, but the same figures were venerated by the masses as real idols, from which miracles were expected.

Even in Christianity, the borderline between symbol and idol is not always distinct. The Church, of course, condemns idolatry, the worship of idols, and requires that individual figures be considered only as representations of divine power. More primitive people in some Catholic countries, however, often look upon relics of saints and statues of the Virgin Mary as literally miraculous forces. The representation is expected to possess grace-giving powers. See *Iconoclast.*

Idomeneus (*ī-dŏm'ē-nūs*), a legendary King of Crete who fought in the Trojan War. On his return home, his ship was caught in a storm; Idomeneus vowed that if his ship were saved, he would sacrifice to Poseidon the first living being he met on land. Although this proved to be his son, he lived up to his oath. After he slew his child a plague broke out and Idomeneus was forced to flee to Italy.

Idrisi (*ī-drē'sī*) or EDRISI, geographer, born in Ceuta, Morocco, *ca.* 1099; died *ca.* 1154. He was attached to the court of Roger II of Sicily, where he compiled his description of the world, the most significant geographic work of the period.

Idun (*ē'dōōn*), in Old Norse mythology, the goddess of spring, who had in her possession the magical apples which the gods ate to retain their youthfulness. Because of this, she was stolen by the giants with the help of Loki (*q.v.*), who was later forced by the gods to release her. Some myths make her the wife of Bragi, the Old Norse god of poetry.

Idyl (*ī'dĭl*) or IDYLL, in literature, a term for a poem that represents scenes of pastoral life, or which is highly descriptive in treating one or more subjects. The Greek poet Theocritus (*q.v.*) wrote several idyls, of which ten survive. Tennyson's "Idylls of the King" consists of 12 poems based on the Arthurian legends.

Ifni (*ĭf'nī*). See *Spain:* COLONIES.

Ignatius of Antioch (*ĭg-nā'shĭ-ŭs*), SAINT, surnamed Theophorus (God-bearer), bishop of Antioch and Father of the Church, born in Syria, *ca.* A.D. 50; died in Rome in 107. The only information known about his life is derived from his seven epistles, written to the Christian communities in Ephesus, Magnesia, Tralles, Rome, Philadelphia, and Smyrna, and to St. Polycarp. The letters were written at a time when Ignatius had been sentenced to die as a Christian and was being sent to Rome, where he was sacrificed to wild beasts in the Roman amphitheater. Reflecting the contemporary state of Christianity, the epistles enjoin Christians to avoid heresy, by adhering to the authority of the Church bishops, and to glorify the heroism of the martyrs. His feast day is Feb. 1.

Ignatius of Constantinople, SAINT, patriarch of Constantinople and a Father of the Church, born *ca.* 799; died Oct. 23, 877. A son of Emperor Michael I, he was imprisoned in a monastery by Leo V to prevent his succession to the throne. Adjusting easily to the religious life, he became a monk and was made patriarch of Constantinople in 847. On the accession of Michael III, whose profligacy Ignatius had opposed, he was replaced by Photius, a scheming layman. After a period of exile, his followers asked Pope Nicholas I to interfere, and Ignatius

was restored as the legitimate patriarch in 867 when Basil I became emperor. His feast day is Oct. 23.

Ignatius of Loyola. See *Loyola, Ignatius of.*

Igneous Rock (*ig'nē·us rŏk'*) See *Geology.*

Ignis Fatuus (*ig'nĭs făt'ū·ŭs*), a Latin term applied to a luminous appearance in the atmosphere a few feet above the ground in marshes, burial grounds, and other places where there is vegetable or animal matter in a state of decay. The cause is thought to be the escape of gaseous substances from decaying organic matter, which ignite spontaneously by a union of different forms of gases. Common names applied to this phenomenon are Jack-o'-lantern and Will-o'-the-wisp.

Ignition (*ĭg·nĭ'shŭn*), from the Latin *ignire* = to ignite; ignition means burning or setting on fire. The term is particularly applied to the internal-combustion engine (*q.v.*). In the Otto engine, used in cars, most trucks, and reciprocating airplane engines, ignition is caused by an electric spark from the spark plug. The ignition is usually slightly advanced, that is, the spark is made to come just before the cylinder, filled with vaporized fuel and air, is at top dead center. The fuel, gasoline, must contain sufficient easily vaporizable components to ignite easily. Ignition may take place by flame propagation, or it may take place explosively, which causes "knock" and loss of power (see *Octane Number*).

In the diesel engine (*q.v.*) a jet of fuel is injected into the cylinder at the top of the compression cycle and is ignited by the heat developed by the compression. The fuel should contain compounds in which the carbon atoms are in one long chain.

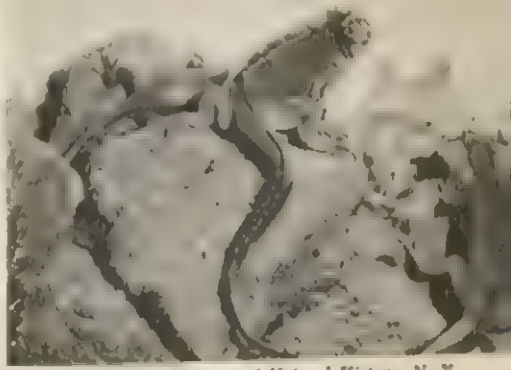
In a rocket (*q.v.*) using an oxidizing agent and a fuel, it is often convenient to have a "hypergolic" or self-igniting propellant. Nitric acid and aniline form such a combination.

Ignorance (*ig'nō·rəns*), a legal term, known in Latin, *Ignorantia juris.* It is the general rule of criminal law stating that lack of knowledge of a law is no excuse for committing a crime or avoiding the consequences of an act.

Igorot (*ī'gō·rŏt*), the name of the people native to the mountainous regions of Luzon Island in the Philippines. The Igorot are a mixture of Malay and Mongol races and are notably warlike. Their dialect, belonging to the Malayo-Polynesian language group, is also called Igorot. The term was once applied, though loosely, to uncivilized tribes of Malay blood on the island.

Iguala (*ē·gwä'lä*), a city in Guerrero state, southern Mexico, *ca.* 50 m. s.w. of Cuernavaca. Located in a rich agricultural and silver mining district, it was severely damaged by an earthquake in 1907. Here, on Feb. 24, 1821, Agustín de Iturbide (*q.v.*) promulgated the famous Plan of Iguala which included provisions for guaranteed independence from Spain, racial equality, and the continuation of Roman Catholicism as the official religion. Actual independence was proclaimed a few months later. Population, 1948, 18,000. See *Mexico.*

Iguana (*ĭ·gwä'nə*), a genus of lizards inhabiting the warmer parts of Central and South America. They attain a length of up to 6 ft. and a weight of 30 lb. They commonly live in trees, especially along rivers, although some species frequent rocks or coast lines. The males possess a high and erectile crest, composed of numerous spikelike structures, along the midline of the head and back. These 6-ft., veritable living dinosaurs are largely vegetarians, but they will eat insects, worms, young birds, etc. Their flesh is white, tender, and sweet, and much prized as human food.



Courtesy American Museum of Natural History, N. Y.
MARINE IGUANAS

Iguanodon (*ĭ·gwăn'ō·dŏn*), a genus of extinct lizardlike dinosaurs. The tail and hind legs were large, the forelegs very small and apparently not used in walking. Thus the general stance and proportions were kangaroolike. It was these reptiles that Thomas Henry Huxley (*q.v.*) thought were in all probability the ancestors of birds.

Iguassú Falls (*ē·gwä·sōō' fälz*), formerly called Victoria Falls, a series of 20 cataracts in the Iguassu River on the Argentina-Brazil boundary. About 2½ m. wide, the falls average 200 ft. in height and are separated by islands of rock and trees.

Ij (*ī*) or **y.** See *Y.*

IJmuiden (*ī·mōō'dĕn*) or YMUIDEN, a seaport city in The Netherlands, in the province of North Holland, part of the municipality of Velsen, on the North Sea, 14 m. N.W. of Amsterdam. Situated at the mouth of the North Sea Canal which connects it with Amsterdam, it is primarily a shipping center. A dredged channel, more than 40 ft. below mean sea level, ex-

tends from the North Sea harbor to the canal locks. The port has a large fishing industry, and some iron and steel are produced here. During World War II, IJmuiden was used as a German torpedo base. Population, *ca.* 28,000.

IJssel Meer (*ī'sĕl mâr*) or YSSEL, a reclaimed area in The Netherlands. See *Zuider Zee*.

Ikhnaton (*ĭk-nä't'n*) or AKHENATON. See *Amenhotep IV*.

Ile-de-France (*ēl-dê-frän̄s'*), a region and former province in northern France, comprising the modern departments of Seine, Seine-et-Oise, Seine-et-Marne, Oise, and Aisne. Situated in the center of the fertile Paris basin where the Marne, Aisne, Oise, and Seine rivers converge, it supplies the Paris area with fruits, vegetables, and dairy products and is the site of many industrially important towns. The region, which was the nucleus of the fief held by the French crown as early as the 10th century, was the political center of early France.

Ileum (*ĭl'ê-ŭm*), in anatomy, the longest part of the small intestine (comprising the duodenum, jejunum, and ileum). It forms the last three-fifths of the small intestine after the end of the duodenum and connects the jejunum (the other two-fifths) with the large intestine. In man, the small intestine is *ca.* 23 ft. long; the duodenum is *ca.* 10 in. long. See also *Intestines*.

Ili (*ē'lē'*), a river in Asia. Rising in the northwestern part of Sinkiang province, China, it flows *ca.* 600 m. westward through Sinkiang and the Kazakh S.S.R. to Lake Balkhash. The Ili is navigable for *ca.* 280 m. above Kuldja (sometimes called Ili), the chief city along its banks. The principal tributaries are the Kash, the Kunges, and the Tekes.

Iliad (*ĭl'ĭ-ăd*). See *Homer*.

Iliamna (*ĭl-ĭ-ăm'nȧ*), an active volcano in southern Alaska, on the west coast of Cook Inlet, *ca.* 150 m. s.w. of Anchorage. Iliamna, *ca.* 10,085 ft. high, is part of the Aleutian Range.

Ilion (*ĭl'ĭ-ŭn*), a village in north central New York, 11 m. s.e. of Utica, on the Mohawk River and the Barge Canal. It is on the New York Central R.R. Ilion manufactures firearms, typewriters, and tabulating machines. It is in the Utica-Rome S.M.S.A. and had a value added by manufacture in 1958 of $34,025,000. Settled *ca.* 1816, it was incorporated in 1852. Population, 1960, 10,199.

Ille-et-Vilaine (*ēl-ā-vē-lĕn'*), a department of France on the English Channel. Situated in an agricultural region which has stock raising and dairying, it is a center for beekeeping and cider-making (there are fine apple and pear orchards). Its mineral resources include iron and lead, as well as granite quarries. The industries include tanning and shoe manufacturing at Rennes, the capital, shoe manufacturing at Fougères, and oyster fishing at Cancale. Chief resorts along the rocky coast are Dinard, St.-Malo (the chief port), and St.-Servan-sur-Mer. Named for two of its rivers, the department was formed in 1790 from the eastern part of Brittany and has an area of 2,700 sq. m. Population, 1954, 586,812.

Illegitimacy (*ĭl-lê-jĭt'ĭ-mȧ-sĭ*), in law or social status, the condition of a person whose parents were not married at the time of his birth.

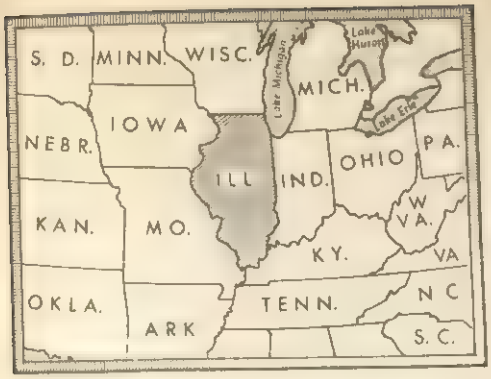
Illimani (*ē-yē-mä'nē*), MOUNT, one of the highest peaks of the Bolivian Andes, s.e. of La Paz. It is 21,184 ft. high and is permanently snowcapped. Rich deposits of minerals and thick forests are found in its vicinity.

Illinium (*ĭ-lĭn'ĭ-ŭm*). See *Promethium*.

Illinois (*ĭl-ĭ-noi'*), a river of Illinois, formed by the confluence of the Kankakee and Des Plaines rivers in the northeastern part of the state, *ca.* 40 m. s.w. of Chicago. After a course of 273 m. to the southwest across the state, along which it receives the Fox and Sangamon, it empties into the Mississippi 15 m. above Alton. The Chicago Sanitary and Ship Canal (*q.v.*) connects it with Lake Michigan. Peoria is the chief city facing the river.

Illinois, a state in the East North Central section of the U.S., outstanding in manufacturing and agricultural and mineral output and the hub of a great network of air, land, and water routes. Illinois ranks first among the states in meat packing and second in the production of corn.

Illinois is bounded on the N. by Wisconsin, on the E. by Lake Michigan, Indiana, and Kentucky, on the S. by Kentucky and Missouri, and on the W. by Missouri and Iowa. It ranks 24th in size among the states and fourth among the states in population, according to the 1960 Decennial Census of Population (the District of



Columbia included in both rankings). The state's name means "tribe of superior men" and comes from the word *Iliniwek*, the name of an Algonkian Indian tribe, to which the French suffix *ois* has been added. The state nicknames are the "Prairie State" and the "Sucker State." The latter comes from the fact that in the early 19th century, the lead and zinc miners of the state journeyed northward to the mines at Galena in the spring and returned home in the autumn, in a manner reminiscent of the migratory suckerfish.

Location	Between 87°35′ and 91°40′ W. long. and 36°58′ and 42°30′ N. lat.
Area	56,400 sq. m.
Land	55,930 sq. m.
Inland water	470 sq. m.[1]
Greatest extent:	
North to south	385 m.
East to west	218 m.
Population (1960)	10,081,158
Capital city	Springfield
Highest point	Charles Mound (1,241 ft.)
Lowest point	279 ft. above sea level (Mississippi River)
Admitted to the Union (21st state)	1818
Song	"Illinois," words by Charles H. Chamberlin, music by Archibald Johnston
Flower	Violet
Bird	Cardinal
Motto	"State Sovereignty—National Union"
Flag	See color plate in Vol. XI

[1] Including part of Lake Michigan, the water area is 1,991 sq. m., bringing the total area to 57,926 sq. m.

Geography

Illinois is tremendously fortunate in its geographic location. Not only is it situated in a central position with access to the Mississippi and Great Lakes water systems, but some 90 per cent lies within the vast central lowland of America that is ideally suited to agriculture. The dark-black soil of this fertile, well-drained, Central Plains region is known for its grain production and particularly for its corn. Mile after mile of the level or slightly undulating prairie land of Illinois is planted in corn. The great levelness of much of the state is probably the result of the four glaciers which covered it centuries ago. Portions of the state not touched by

ANNUAL STATE EVENTS

Lincoln's Birthday Commemoration	Feb. 12; Lincoln's Tomb, Springfield
Golden Gloves Boxing Tournament	February March, Chicago Stadium
Passion Play	Sundays, Palm Sunday through June, at Zion; April and May, Scottish Rite Temple, Bloomington
Easter Sunrise Service	Easter Sunday; Soldier Field, Chicago, Bald Knob, Union County
Boy Scout Pilgrimages	April; Lincoln's Tomb, Springfield; Grant's Home, Galena
Outdoor Concerts	July 1–Labor Day; Grant Park Band Shell, Chicago; Ravinia, Highland Park
Illinois State Fair	Ten days in mid-August Illinois State Fairgrounds, Springfield
Musicland Festival	Third week in August; Soldier Field, Chicago
Pony-Grad Baseball World Series	Last week in August; Lanphier Park, Springfield
Robert Sherwood's "Abe Lincoln in Illinois"	August and Labor Day week end; Kelso Hollow, New Salem State Park; presented by Lincoln Players, Inc.
The Hambletonian	Early September, Race Track, Fairgrounds, DuQuoin
International Livestock Show	Fourth week in November; International Amphitheater, Chicago

the great ice sheets include Jo Daviess County (a hilly area in the extreme northwest corner), a portion in the west central region, and the seven counties in the extreme south. An extension of the Ozark Plateau runs across the southern part of the state, with several Ozark hills over 1,000 ft. high. This area was once forested, but the pioneers chopped down much of the timber for fuel and construction, and only a small portion remains. The area, however, is rich in petroleum and coal. A small, highly fertile region located in the southernmost part of the state near Cairo, at the confluence of the Mississippi and Ohio rivers, is known as "Egypt" because of the extremely rich soil, the location and fertility reminding many of the Nile delta.

Illinois has many rivers and streams. The state's boundaries are formed by the Mississippi on the w., by the Wabash on the s.e., and by the Ohio on the s. The largest river within the state is the Illinois, flowing northeast to southwest and draining 43 per cent of the state. Other important rivers are the Rock, the Kaskaskia, the Sangamon, the Big Muddy, the Embarras, and the Little Wabash. There are few natural lakes, and these are chiefly in the northeast. A considerable widening of the Illinois River at Peoria is known as Lake Peoria. The artificial lakes, created to provide water for urban areas and much used for recreation, include Crab Orchard Lake, Lake Bloomington, Lake Decatur, and Lake Springfield.

Aside from its state parks and memorials, the state has many places of interest. They include the Great Lakes Naval Training Station, near Waukegan, the world's largest naval training post; the Merchandise Mart, Chicago, second-


ILLINOIS
RESOURCES AND PRODUCTS
Scale of Miles
0 5 10 20 30 40 50 60
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WISCONSIN
INDIANA
IOWA
MISSOURI
KENTUCKY
LAKE MICHIGAN
Mississippi River
Rock River
Illinois River
Missouri River
Kaskaskia River
Wabash River
Ohio River
Waukegan
Rockford
Chicago
Aurora
Moline
Rock Island
Ottawa
Kankakee
Galesburg
Peoria
Bloomington
Champaign
Danville
Quincy
Jacksonville
Springfield
Decatur
Litchfield
Effingham
Alton
East St. Louis
Mount Vernon
Cairo
ZINC & LEAD
BUTTER
HAY
CHEESE
MACHINERY
GREEN PEAS
FURNITURE
DAIRYING
LAKE RESORTS
SEASHORE RESORTS
CLOTHING
HARDWARE
FARM MACHINES
LIMA BEANS
CLOCKS
RADIOS & TELEVISION
PRINTING
SHIPPING
ASPARAGUS
WIRE
STONE
ELECTRICAL EQUIPMENT
MEAT PACKING
RAILROAD EQUIP
IRON & STEEL
OATS
SOAP
GLASS
AUTOMOBILES & PARTS
PAPER
RUBBER GOODS
HEATING EQUIP
CORN
TRACTORS
GUNS
CATTLE
HOGS
SMELTING & REFINING
OIL REFINING
METAL PRODUCTS
DRUGS
PAINT
SHEEP
EXPLOSIVES
BRICK
FURNITURE
MACHINERY
WATERMELONS
LIQUOR
CONSTRUCTION MACHINERY
PUMPKINS
SOYBEANS
WATER POWER
POTTERY
COAL
VACUUM CLEANERS
SWEET CORN
WHEAT
COWPEAS
ELECTRICAL EQUIPMENT
CORN PRODUCTS
FLOUR
APPLES
BROOMCORN
SHOES
IRON & STEEL
AMMUNITION
POULTRY
HAY
PEARS
AUTOMOBILE PARTS
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FORESTS
STRAWBERRIES

largest office building in the world, surpassed only by the Pentagon, Washington, D.C.; the Argonne National Laboratory, 25 m. s.w. of Chicago, one of the principal existing centers for design and development of nuclear reactors; and Buckingham Memorial Fountain, in Grant Park on Lake Michigan. Linked with the early history of the state are the Centennial Bldg., constructed 1918-23, commemorating Illinois's entrance into the Union in 1818; and the Sangamon County Courthouse, state capitol (1840-76) and scene of many of Lincoln's activities during his Springfield residence.

Climate: Illinois is known for the variability of its climate. Extremes of temperature are typical, particularly in the northern sections. Generally, however, the temperatures in the south are warmer.

	Anna	Chicago	Peoria
Normal temperature			
January	36.0° F.	24.9° F.	25.0° F.
July	78.8° F.	74.6° F.	75.7° F.
Annual mean	57.6° F.	50.1° F.	51.0° F.
Latest frost	April 10	May 13	May 25
Earliest frost	Oct. 25	Sept. 25	Sept 29
Precipitation			
January	4.24 in.	1.84 in.	1.97 in.
July	2.95 in.	2.73 in.	3.70 in.
Annual	48.75 in.	32.72 in.	35.18 in.
Average growing season	198 days	196 days	188 days

Natural Resources

Bituminous coal reserves that extend over two-thirds of the state produced 45,246,000 short tons in 1961, giving Illinois fourth rank among the states in coal output. It ranks third in the national output of stone, first in fluorspar (used in the manufacture of ceramics, chemicals, and steel), and first in tripoli. Petroleum, however, is the most important mineral in the state's economy. Among the state's other mineral resources are cement, clays, lime, natural gas and natural-gas liquids, nickel, peat, silver, sulfur, and zinc.

Forest lands total 3,993,000 acres, chiefly of hardwoods: ash, aspen, beech, basswood, cottonwood, elm, red and sap gum, hickory, maple, oak, yellow poplar, sycamore, and walnut. The state's commercial timber resources include *ca.* 11,695,000,000 bd. ft. of live sawtimber.

The fertility of the state's soil and the excellent distribution of rainfall contribute greatly to the agricultural prosperity of Illinois.

The Economy

At the time of the 1960 census, Illinois had an employed population of 3,899,472. Of this total, *ca.* 32 per cent were in manufacturing; 5 per cent in construction; 4 per cent in agriculture, forestry, and fisheries; and 0.6 per cent in mining. The remainder were employed in the wholesale and retail trades, in government, and in supplying personal, professional, and other services.

The most important manufactures in Illinois are processed foods, including grain mill products, beverages, candy, and meats; nonelectrical machinery, particularly for metalworking, construction, and agriculture; fabricated metal products, including structural parts, screws, nuts, bolts, tools, hardware, cutlery, and cans; printed matter; and chemicals. In 1961 the state's value added by manufacture totaled $12,752,785,000, of which well over half was produced in the Chicago area.

There were 154,644 farms in 1959, occupying a total of 30,327,000 acres. The average farm had 196 acres, with land and buildings valued at $61,946. The state ranks high in the nation for the value of its farm marketings, which totaled $2,160,432,000 in 1961. A little over half of this income is normally derived from livestock and livestock products, particularly from the sale of cattle, calves, and hogs for meat, dairy products, and eggs. The most important field crops are corn and soybeans. The state ranks second in corn production and first in soybean production. Other important crops are grains for animal feed, oil, and grain milling, hay, vegetables, and fruits.

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Illinois's mineral output was valued at $571,605,000 in 1961, comprising 3.15 per cent of the total U.S. value and placing the state eighth among the states. The principal minerals, in order of their production value, were petroleum, coal, stone, and sand and gravel.

Because Chicago is the second largest city and centrally located geographically, tourism and convention business contribute greatly to the economy of the state.

Transportation and Communication

Fortunate in having access to two of the great inland waterways of North America, the state linked the two systems by means of the Illinois-Michigan Canal, which was opened in 1848. It was replaced in 1900 by the Chicago Sanitary and Ship Canal, which links the Mississippi and Lake Michigan via the Chicago, Des Plaines, and Illinois rivers and reverses the flow of the Chicago River from Lake Michigan, thus diverting sewage into the Mississippi drainage system. The entire route, known as the Illinois Waterway, makes low-cost barge shipments possible; it is a link in the Lakes-to-Gulf-Waterway. The deepening and widening of Lake Calumet-Sag Channel, which will enable larger ships to pass


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Ottawa
Kankakee
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Rock Island
Galesburg
Peoria
Bloomington
Champaign
Danville
Quincy
Jacksonville
Springfield
Decatur
Litchfield
Effingham
Alton
East St. Louis
Mount Vernon
Cairo
ZINC & LEAD
BUTTER
HAY
CHEESE
MACHINERY
GREEN PEAS
FURNITURE
DAIRYING
LAKE RESORTS
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from Lake Michigan to the Illinois River, has begun. The opening of the St. Lawrence Seaway in 1959 gave Chicago direct access to the ocean via the Great Lakes.

Chicago is not only the world's most active railroad center, but also its busiest rail-freight center, handling more freight traffic than New York City and St. Louis, Mo., combined. The Chicago Terminal District, a switching area, covers some 1,750 sq. m. The state is served by about 60 railroads. The first railroad to operate in the state was the Northern Cross R.R. in 1838, now part of the Wabash R.R. Other railroads include the Atchison, Topeka and Santa Fe Ry., the Baltimore & Ohio R.R., the Chicago Great Western Ry., the Chicago, Milwaukee, St. Paul and Pacific R.R., the Gulf, Mobile and Ohio R.R., and the Illinois Central R.R. Railroad mileage in 1960 was 11,201. The state has a total of 123,350 m. of rural and municipal roads, including 8,663 m. of unpaved rural roads. Route U.S. 66, which runs 295 m. from Chicago to East St. Louis, bisects the state. An east-west toll-road system is being constructed. Trucking has become a major phase of transportation, with over 2,500 branch lines and cartage companies in the state. Chicago is the air transportation center of the nation, with two airports, Midway Airport and O'Hare Field.

In 1961 Illinois had 120 radio and 17 television stations. The first newspaper published in the state was the *Illinois Herald* (Kaskaskia, 1814). Among today's leading papers are Chicago's *Daily News, American, Sun-Times,* and *Tribune;* the Bloomington *Daily Pantagraph;* the Peoria *Journal Star;* and the Rockford *Morning Star.*

Population

Illinois has 102 counties. The 1960 census population was 10,081,158 (1962 est. population, 10,146,000), an increase of 15.7 per cent over that of 1950. The urban population comprised 8,140,315, or 80.7 per cent; the rural population, 1,940,843, or 19.3 per cent. Between 1950 and 1960, the urban population rose 20.4 per cent; the rural decreased by 0.6 per cent. More than 82 per cent of the 1960 urban population lived in the urbanized areas of Aurora; Champaign-Urbana; Chicago and northwestern Indiana; Davenport-Rock Island-Moline; Decatur; Peoria; Rockford; and Springfield. In 1960 white persons numbered 9,010,252; the 1,070,906 nonwhites included 1,037,470 Negroes, 14,074 Japanese, and 7,047 Chinese. Native-born residents totaled 9,395,555; the foreign-born, 686,098. Population density averaged 180.3 persons per sq. m.

The major religious bodies are the Christian Churches, International Convention (Disciples of Christ); the Jewish congregations; the Lutheran Church in America; the Lutheran Church—Missouri Synod; The Methodist Church; the Roman Catholic Church; the Southern Baptist Convention; the United Church of Christ; and The United Presbyterian Church in the U.S.A.

Chief Cities: Chicago, on Lake Michigan, the state's largest city and the second-largest in the U.S., is a great industrial metropolis, iron and steel producer, transportation hub, grain and livestock market, and a mail-order and meat-packing center.

Rockford, near the Wisconsin border, is second in size and is best known for its furniture and machine tools.

Peoria, on the Illinois River, the state's third-largest city, is a port and transportation center, noted for its trade in grain and for its manufacturing.

Springfield, the capital city and fifth in size, is a manufacturing center and was the home of Abraham Lincoln.

Famous Men and Women: Addams, Jane (1860-1935), founder (1889), with Ellen Gates Starr, of Hull House, Chicago; shared 1931 Nobel Peace Prize with Nicholas Murray Butler.

Altgeld, John Peter (1847-1902), German-born governor of Illinois (1893-97).

Farrell, James T. (1904-), journalist and novelist ("Studs Lonigan").

Harrison, Carter Henry (1825-93), Kentucky-born lawyer and politician; five times mayor of Chicago (1879-87, 1893). His son, Carter Henry Harrison (1860-1953), was mayor of Chicago six times (1897-1907, 1911-13); publisher and editor of the Chicago *Times.*

Lincoln, Abraham (1809-65), 16th President of the U.S. (1861-65).

Lindsay, Vachel (1879-1931), poet ("The Congo," "The Chinese Nightingale").

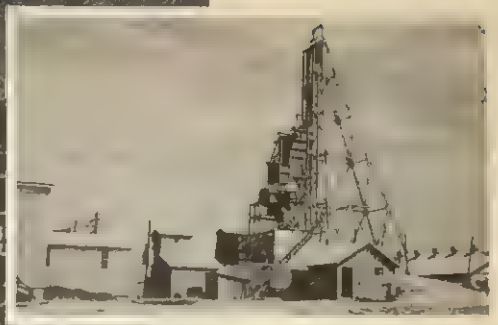
Lovejoy, Elijah Parish (1802-37), abolitionist editor of the Alton *Observer;* killed by a pro-slavery mob at Alton. His brother, Owen Lovejoy (1811-64), also an abolitionist, was an early supporter and friend of Lincoln; U.S. Representative (1856-64).

McCormick, Cyrus Hall (1809-84), who invented the reaper (patented in 1834) and established the McCormick Harvesting Machine Company.

McCormick, Robert Rutherford (1880-1955), newspaper publisher, grandson of Joseph Medill; publisher and editor of the Chicago *Tribune* (from 1920).

Medill, Joseph (1823-99), Canadian-born journalist; editor and publisher (from 1874) of the Chicago *Tribune;* one of the founders of the Republican party.

Mundelein, George William (1872-1939), New York-born Roman Catholic cardinal.



INDUSTRIES OF ILLINOIS

An oil refinery at Wood River (*above*) operates around the clock (*courtesy Shell Oil Co.*). Mineral refining is also important; a lead and zinc smelter is shown above right. This is a familiar scene in Illinois (*center right*), where dairying is one of the principal industries (*courtesy Illinois Departmental Information Service*). The iron and steel industry is represented in the state, too; here (*below*), a workman pours a test ladle of alloy steel from an electric furnace. From this sample, the final analysis of the steel will be determined in the laboratory (*courtesy U.S. Steel Corp.*). In one of the state's many meat-packing plants, hams are inspected (*bottom right*) by means of an icepick-like instrument (*courtesy Armour and Co., Chicago*)

Murphy, John Benjamin (1857-1916), Wisconsin-born surgeon who improved surgical techniques.

Sandburg, Carl (1878-), poet ("Chicago Poems") and biographer of Abraham Lincoln.

Stevenson, Adlai Ewing (1835-1914), Kentucky-born Vice President of the U.S. (1893-1907). His grandson, Adlai Ewing Stevenson (1900-), a lawyer, was governor of Illinois (1948-52) and Democratic-party candidate for President of the U.S. (1952, 1956).

Stone, Melville Elijah (1848-1929), journalist, cofounder of the Chicago *Daily News* (1875); Associated Press executive (1893-1923).

Education

Education is free and compulsory for children between seven and 16. Public-school attendance in 1962 was 1,889,746, and there were an additional 423,400 enrolled in Roman Catholic parochial schools. The leading state-supported institutions of higher learning include the Univ. of Illinois, Urbana, with branches in Chicago; Southern Illinois Univ., Carbondale; Northern Illinois Univ., De Kalb; Western Illinois Univ., Macomb; Eastern Illinois Univ., Charleston; and Illinois State Normal Univ., Normal. Among private or denominational colleges are the Univ. of Chicago, De Paul Univ., Illinois Inst. of Technology, Loyola Univ., and Roosevelt Univ., all in Chicago; Illinois Weslyan Univ., Bloomington; Northwestern Univ., Evanston, with branches in Chicago; Bradley Univ., Peoria; and Illinois Coll. and MacMurray Coll., Jacksonville.

Chicago is the site of many of the educational and cultural institutions of the state, including the Art Inst. of Chicago; the Chicago Historical Society; the Adler Planetarium and Astronomical Museum; the Oriental Inst. at the Univ. of Chicago; the Chicago Acad. of Sciences, Museum of Natural History; the Chicago Natural History Museum (formerly the Field Museum); the Museum of Science and Industry; the Lincoln Park Zoo; the John G. Shedd Aquarium; the Chicago Public Library; the Newberry Library; the John Crerar Library; and the Library of International Relations. In Springfield are the Illinois State Museum, the Illinois State Library, and the Illinois State Historical Library, with its outstanding Lincoln and Civil War collections.

Government

Illinois is governed under provisions of a constitution dating from 1870. It has rarely been amended because until 1950 the amendment procedure was extremely difficult. The constitution gives executive authority to a governor, lieutenant governor, secretary of state, treasurer, auditor of public accounts, superintendent of public instruction, and attorney general. Each is elected for a term of four years; the treasurer may not succeed himself.

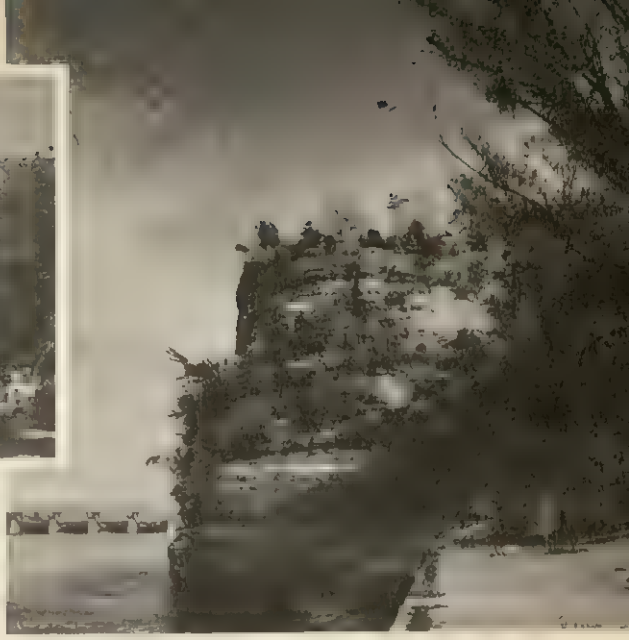
The legislature, known as the general assembly, consists of a senate of 58 members (of whom one half are renewed every two years), serving for four-year terms, and a house of representatives of 177 members, serving for two-year terms. Each voter is permitted three votes for representative; he may cast all three for a single candidate, one for each of three, or one and a half votes for each of two. The legislature convenes on the Wednesday after the first Monday in January in odd-numbered years. There is no time limit for its sessions, but it customarily adjourns by July 1, since no act can take effect until the first day in July following its passage—unless, in an emergency, it is passed by two-thirds of the general assembly. The governor may summon special sessions for specific purposes.

The supreme court consists of seven members (a chief and six associate justices) elected for nine-year terms; members are court-appointed in rotation for a one-year term as chief justice. There are four appellate courts and 17 circuit courts outside Cook County. Cook County makes up a single judicial district with its own superior, circuit, and lesser courts. The state is represented in the U.S. Congress by two Senators and 24 Representatives.

History

The earliest known residents of Illinois were the prehistoric Indians called Mound Builders; some 10,000 of their ceremonial, burial, and other types of mounds still exist.

The first recorded exploration of the state by white men occurred in 1673, when the French missionary Father Jacques Marquette, the French-Canadian explorer Louis Joliet, and five companions traveled up the Illinois River. In 1780 the French explorer La Salle built Ft. Crèvecoeur, near where Peoria now stands, and in 1682-83, Ft. St. Louis (on Starved Rock). Jesuits established missions at Cahokia (1699) and Kaskaskia (1703). From 1717 the region was part of the French province of Louisiana, becoming a separate province in 1731. It was formally surrendered by the French to the British in 1765, under the terms of the treaty of Paris, which transferred all French lands east of the Mississippi to Britain. George Rogers Clark led the Americans who captured Kaskaskia and Cahokia in 1778 and claimed Illinois for America in the name of Virginia; it became a county of Virginia in 1779. Illinois was part of the Northwest Territory (1787-1800) and then became a part of the newly organized Territory of Indiana. The Illinois Territory was created



MODERN AND HISTORIC ILLINOIS

The home of Abraham Lincoln (*top left*), in Springfield, was the only house the President ever really owned. Starved Rock (*above*), situated in one of the state's many beautiful parks, is some 100 ft. above the Illinois River (*Hedrich-Blessing*). The Lincoln Tomb (*center left*), in Oak Ridge Cemetery, Springfield, is visited by many thousands every year. Chicago's Michigan Blvd. (*below*) is one of the most famous and impressive streets of the Prairie State metropolis

Courtesy Ewing Galloway, N. Y.

BLACK HAWK STATUE IN OREGON, ILL.

This monument to the Indian chief who led the tribesmen in the Black Hawk War of 1832 was executed by Lorado Taft (1860-1936)

Courtesy Czechoslovak Information Service

NAMED FOR ITS EUROPEAN COUNTERPART

Stern Park Gardens, Ill., was renamed Lidice to commemorate the Czechoslovakian village, totally destroyed in 1942

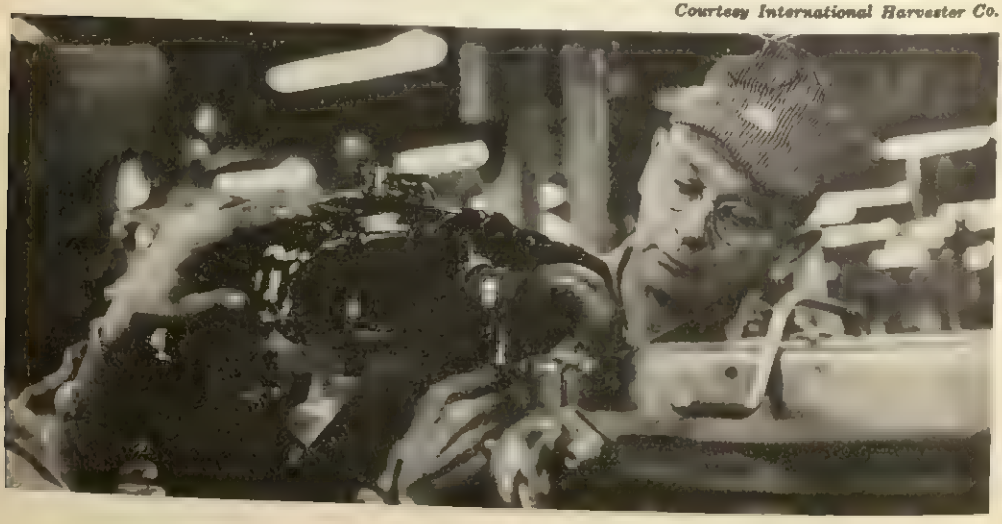
in 1809, with Kaskaskia as the capital, and included Wisconsin. After the War of 1812, during which pro-British Indians massacred the Americans leaving Ft. Dearborn, new settlers appeared on the broad prairies in rapidly increasing numbers, and agriculture soon surpassed the fur trade in economic importance. Illinois, minus the Wisconsin area, was admitted to the Union as a free state on Dec. 3, 1818. The capital was moved to Vandalia in 1820 and to Springfield in 1839. Indian attempts to curb settlement culminated in the Black Hawk War (1832), in which the Indians were defeated and driven west of the Mississippi. Mormons settled at the town of Nauvoo in 1839 but migrated to Utah in 1846, two years after their leader, Joseph Smith, and his brother Hyrum were murdered, an incident of mob violence characteristic of the state's early history. The Lincoln-Douglas debates over slavery (1858) attracted national attention. The state remained loyal to the North during the Civil War, although many in the southern section favored slavery.

The problems caused by the rapid expansion

ILLINOIS AGRICULTURAL MACHINERY PLANT

The state is an important producer of various types of farm equipment

Courtesy International Harvester Co.



MAJOR RECREATIONAL AND HISTORIC FEATURES

Name and Type	Size and Location	Points of Interest
Chicago Portage National Historic Site (established 1952)	91 acres near Chicago (U.S. 6, 41)	Preserves part of the portage discovered by Marquette and Joliet and used by early settlers
Shawnee National Forest (established 1939)	683,658 acres in the south (U.S. 45, 51; state 1, 3, 13, 34, 127, 144, 145, 146, 151)	Confluence of the Mississippi and Ohio rivers at Cairo; prehistoric stone forts and Indian mounds; includes Giant City State Park
Dickson Mounds State Memorial (established 1945)	25 acres near Havana (state 78, 97)	Site of excavation of Indian skeletons, tools, pottery, weapons, and ornaments
Ft. Kaskaskia State Park (established 1927)	238 acres north of Chester (state 3)	Earthen ramparts of French fort; Garrison Hill Cemetery; region captured from British by George Rogers Clark during Revolutionary War
Illinois Beach State Park (established 1944)	1,651 acres between Waukegan and Zion (off state 42)	3.5-m. sand beach on the shore of Lake Michigan
Lincoln Home State Memorial (established 1887)	Springfield, at Eighth and Jackson Sts. (U.S. 36, 54, 66; state 4, 29, 97, 125)	Only home ever owned by Lincoln, who lived there from 1844 to 1861
Lincoln Memorial Garden (established 1936)	60 acres on Lake Springfield (U.S. 36, 54, 66; state 4, 29, 97, 125)	Planted with the trees, shrubs, and flowers native to Lincoln's pioneer Illinois
Lincoln Tomb State Memorial (established 1874)	Oak Ridge Cemetery, Springfield (U.S. 36, 54, 66; state 4, 29, 97, 125)	100-ft. obelisk; tomb of Lincoln, his wife, and three of their children (Edward, "Tad," and William)
New Salem State Park (established 1919)	328 acres 20 m. N.W. of Springfield (state 97, 123)	Restoration of village where Lincoln lived (1831-37)
Pere Marquette State Park (established 1932)	2,606 acres 6 m. W. of Grafton (state 100)	Rises above Mississippi and Illinois rivers; a large cross marks the spot where Father Jacques Marquette and Louis Joliet first entered Illinois (1673)
Starved Rock State Park (established 1911)	1,437 acres between Ottawa and La Salle (state 71)	Starved Rock towers out of the Illinois River; site of French Ft. St. Louis du Rocher (1682–83), burned by Indians (1722)
Sangamon County Courthouse (built 1840)	Springfield (U.S. 36, 54, 66; state 4, 29, 97, 125)	Former state capitol, where Lincoln served as a member of the general assembly, practiced law, and gave his "House Divided" speech; and where his body lay in state

of agriculture and industry led to the organization of the Grange movement, representing dissatisfied farmers, and the Knights of Labor, representing factory workers. The Haymarket Riot (1886) and the Pullman Strike (1894) were among the most violent labor incidents in the U.S. Early in the 20th century, legislation was enacted to control industrial abuses.

The scene of a literary movement in the 1890's, the state saw another great surge in poetry, journalism, and fiction during the early 1900's. In the years after World War I, Chicago was notorious as a center of organized crime. During this time, it also produced another literary revival. Illinois furnished 968,755 men and women to the armed forces in World War II, as compared with 323,741 in World War I. Since achievement of the first nuclear chain reaction at the Univ. of Chicago (1942), the state has been a center for atomic-energy research. The largest all-nuclear power reactor in the U.S., the Dresden power station, was opened in 1960 and added 180,000 kw. to the light-and-power system of Chicago and northern Illinois.

See also separate entries on most of the individuals and geographical and historical subjects mentioned in this article.

Illinois Indians, a confederacy of Algonkian-speaking tribes formerly occupying northern Illinois, southern Wisconsin, and portions of Iowa and Missouri. They were almost constantly at war with the Sioux, Fox, Iroquois, and other northern Indian groups. About 1769, as a result of the murder of the celebrated chief Pontiac by an Illinois Indian, the tribe was virtually exterminated by the more powerful tribes of the Great Lakes region. In 1833 the few survivors sold their lands in Illinois and removed to Oklahoma. At present they are much mixed with white blood and number about 400 individuals.

Illinois, UNIVERSITY OF, a coeducational, state institution located in the adjoining communities of Urbana and Champaign, Ill., with certain units in Chicago. Chartered in 1867, the university opened in 1868 as the Illinois Industrial Univ. The name was changed in 1885; women were admitted in 1870. At Urbana-Champaign are located most of the individual colleges, specialized institutes, special service stations, and research bureaus. In Chicago are located the colleges of dentistry, medicine, nursing, and pharmacy; the Illinois Surgical Inst. for Children; the Rush Presbyterian Hospital; and the Chicago Undergraduate Division. Robert Allerton Park, at Monticello, Ill., *ca.* 25 m. from the main campus, is used as a conference center. The library contains more than 3,000,000 items. Enrollment totals *ca.* 27,600, and the faculty numbers 4,000. The university plant is valued at more than $160,000,000.

Illiteracy (*il-lit'ēr-ə-sē*), the term used generally to denote inability to read or write, or both. Illiteracy is a great barrier to one's occupational attainments and to the proper use of citizenship. The statistics of the varied countries differ as to the method of derivation and so cannot be strictly compared. The countries having the lowest percentages of illiteracy have been the

Scandinavian countries, Germany, Switzerland, Scotland, Holland, and France. With compulsory education laws and educational opportunities for adult illiterates, the formerly high degree of illiteracy in the U.S. is being reduced; *e.g.*, according to the 1940 U.S. Census, illiterates (persons over 25 years of age who had not completed any grade in school) formed only [illegible] per cent of the population; however, the same census revealed that 13.5 per cent, or one out of every seven American adults over 25 years old, is "functionally illiterate," *i.e.*, has not had the equivalent of four years of schooling and cannot read with understanding any ordinary newspaper. In July 1943, a Senate Committee reported that the U.S. Army, basing its standards on functional illiteracy, had been rejecting about 28 out of every 1,000 men for being illiterate. Later, the literacy tests were simplified. See *Education, Schools.*

Illumination [illegible] See *Eye, Ophthalmology.*

Illyricum [illegible] was the name of an ancient country in Europe which extended from the northeastern coast of Italy into Macedonia. Philip of Macedon conquered the country as far west as the Drina River and annexed it to Macedonia. The western portion comprised the territory corresponding to Istria, Croatia, Dalmatia and Herzegovina, and the region remained independent until [illegible] when it was made a Roman province. [illegible] generally included [illegible] and Pannonia. [illegible] of these provinces were afterward incorporated with the Eastern Empire. Napoleon organized the Illyrian provinces in 1809. They were united into a kingdom and annexed to Austria in 1816. Later the kingdom was dis[illegible] were never clearly defined. It can be said, however, that [illegible] now occupied by Yugoslavia and Northern Albania.

Iloilo (*ē-lō-ē'lō*), capital of the province of Iloilo, [illegible] on the southeastern shore of the island of Panay. It has an excel[illegible] Manila as a commercial center in the Philippines and [illegible] a large trade in [illegible] and dyewoods. A foundry, a machine shop, and a pottery are among the industrial enterprises. The U.S. bombarded and occupied the city in 1899, at the time of an insurrection. Population *ca.* 20,000.

Image (*im'ij*), from the Latin *imago* meaning picture, a term used in theology, philosophy, and psychology.

In theology, image implies a sculptured or painted representation of Christ, Mary, or of the saints, either in a more or less realistic depiction or a representation of a merely symbolic character, *e.g.*, the monogram or the fish as the symbol of Christ. However, the fear of committing idolatry kept the number of images to a minimum during the first centuries of the Christian era. Only after 500 A.D. did figures of the Lord, the Virgin, and the saints begin to figure prominently in church decorations. See *Iconoclast.*

In various philosophical schools of thought, the term image is used in different senses. It generally implies the representation of a thing or an idea by another thing or idea substituted for the original and possessing the same attributes as does the original.

In psychology, the term image is applied to the consequence of a previously elementary sensual sensation, *e.g.*, the so-called after-image or the memory-image or the hallucinatory image. Generally, the image may be considered as the result of a sensory process, not stimulated by any external impression. See also *Imagination.*

Imaginary Number (*i-mäj'in-ĕr-ē nŭm'bĕr*), a term in mathematics. See *Number.*

Imagination (*im-äj-i nā'shŭn*), that faculty of the mind by which it receives concepts of absent objects, not as they are or were, but as they might be. The original material with which it builds is derived through memory by sense perception, and thus imagination is created in a limited sense. The material secured in this way is used with modification, or it may be [illegible] and then used, and thus new images or mental pictures are created that differ from any product that memory gives. In the combining of images, or the formation of new ones, the laws of the association of ideas govern the operation, but imagination is governed at least partially by the will, for by it the thoughts are controlled to some extent and the limits are determined within which the laws of association are to act. The products of imagination are termed according to the results, as phantasmal, fanciful, artistic, and inventive. Imagination makes possible the culture of fine arts, gives vividness and force to language, lightens life's burdens, and leads to the attainment of success in the practical affairs of life. Its culture is important, since it may serve a good [illegible] or [illegible] depending upon its early and right training.

Imagist (*im'ij·ist*), a member of a school of [illegible] that follows a set of principles enunciated [illegible] developed in opposition to extreme romanticism and depends much upon the use of common language. Through verbal economy and skillful use of imagery, it suggests more than it actually states. Among the leading imagists are Richard Aldington, Hilda Doolittle (H.D.), T. S. Eliot, J. G. Fletcher, D. H. Lawrence, and Amy Lowell.

Imam (*i·mam'*) or IMAM. See *Islam*.

Immaculate Conception [illegible] *kep'shún*), term signifying the doctrine of the Roman Catholic Church which holds that the Virgin Mary was conceived without original sin in the womb of her mother, St. Anne. In the 12th century this idea was generally introduced into the teachings of the Roman Catholic Church. The monastic orders of Franciscans and Dominicans discussed this problem rather vehemently, for the Dominicans did not believe that Mary herself had been conceived without original sin. In 1439 the Council of Basel, in accordance with Franciscan teachings, defended the doctrine and ordered the celebration of the Feast of the Im[illegible] the doctrine of the Immaculate [illegible] came a dogma of the Roman Catholic Church by decree of Pope Pius IX.

Immanuel (*i·mán'u·el*). See *Emmanuel*.

Immersion Foot (*i·múr'shún fút*). See *Ox[illegible]*.

Immigration [illegible] the act of coming into a country for the purpose of establishing there permanently. It is closely associated with problems [illegible] the development of a new country, [illegible] immigration is only one of many [illegible] of a growing country, and it gives the impression to [illegible] as urban [illegible] in the past century the [illegible] of Europe [illegible] immigration to the newer [illegible] especially to the U.S., Canada, Australia, South Africa, and South America. These countries continue to attract settlers because their extensive natural resources are still not thoroughly developed. Immi[illegible] by the U.S. of the [illegible] immigration [illegible] migration, but after 1865 the growth of the rail[illegible] aged colonists from northern and western Europe [illegible] Until this time, the immigrants had been [illegible] ple who brought to America [illegible] upon [illegible] 1890, however, political, religious, and [illegible] restriction in eastern and southern Europe [illegible] came largely urban workers. The advent of World War I, the success of efforts to restrict immigration, and the economic depression which gripped the U.S. in the 1930's cut [illegible] the depression years, climbed a little [illegible] thirties, largely as a result of political and [illegible] again during World War II. At the end of the war immigration again began to increase, first because of the alien war brides who were admitted under special legislation. This wave of [illegible] political emigrés [illegible] Europe by the [illegible] 1948, to June 30, 1950, more than 84,000 immigrants were admitted to the U.S. [illegible] were 120,000 spouses and alien children of members of the armed forces of the U.S., chiefly from [illegible]

[illegible]

all peoples in almost all historical periods.

Materialists, in contrast, believe that all proofs of immortality in a religious sense are not proofs at all, but merely escapist self-deceptions.

The historical development of mankind shows that some primitive tribes do not believe in immortality, while others hold rather general conceptions which crystallize in the belief in survival in the form of spirits or in identification with trees or animals. Although these conceptions seem to be mere superstitions, they nevertheless represent, though in crude form, a belief in immortality. The Egyptians believed in immortality if certain conditions were fulfilled, such as preservation of the body, preservation of the name, and preservation of the "*Ka*" (a life-spending quality). They even believed in a kind of last judgment and in the existence of a dwelling place of the dead. In ancient Greece, the primitive concept of Hades (*q.v.*), the special place where the dead continued as shadows, was later more subtly elucidated by Plato and Aristotle as a concept of the continuation of the human soul in company with the gods. Among the Romans, some writers and philosophers elaborated on the same idea, and there are many connections between the so-called Neo-Platonists (*q.v.*) and the early Christians (see *Christianity; Mohammedanism*). Indian and other Far Eastern religious systems have varied in their ideas about survival of the individual, incarnation (*q.v.*), and Nirvana (*q.v.*). See *Brahmanism; Buddhism; Confucius.*

Of special interest are the various concepts of immortality as they developed in the different non-religious philosophical systems of Western civilization after the Renaissance period. While some philosophers try to connect the ideas of the Christian religion with their own philosophical ideas, some others refute the Christian concept and construct more or less abstract ideas of immortality. These ideas range from the belief in the survival of the individual to the belief in a future fusion of some elements of the individual human being into a more general state of immortal consciousness.

Immortelles (*ĭm-môr-tĕlz'*), or EVERLASTING FLOWERS, a term applied to a class of flowers which do not lose their color or beauty in drying. They are native to Northern Africa and Western Asia, and are cultivated extensively in gardens and greenhouses. The name immortelles was first applied in France, where they are grown extensively and used in making wreaths. In many countries wreaths made of immortelles are placed on graves to symbolize immortality.

Impeachment (*im-pĕch'mĕnt*), the calling into question of the motives of an individual or of the validity of the law. It is applied particularly to the accusation and prosecution of an officer for maladministration, by a legislative body. The proceeding is sanctioned in England, where the House of Commons is the prosecutor and the House of Lords is the trial court. Lord Latimer was the first to be prosecuted by this method. However, the proceeding is now practically obsolete.

In the U.S. the Constitution vests the right of impeachment exclusively in the House of Representatives, but the right of trial is vested in the Senate. The officers liable to impeachment are the President, Vice President, and all civil officers of the U.S. Among the causes for which an officer may be impeached are treason, bribery, and other high crimes and misdemeanors. In the trial by the Senate the regular officer presides, but when the President is impeached the Chief Justice of the Supreme Court is the presiding officer. A two-thirds vote of the Senators present is necessary for conviction. Punishment extends only to removal and disqualification to hold any office under the Constitution of the U.S., but the offender is still liable to an ordinary trial by law. Impeachments of state officers are provided for by the constitutions of the various states. In the U.S. thirteen Federal officers have been impeached, two of whom were convicted. The number embrace Sen. William Blunt of Tennessee, in 1797; District Judge John Pickering of New Hampshire, in 1803; Supreme Judge Samuel Chase of Maryland, 1804; District Judge James H. Peck of Missouri, 1830; District Judge West H. Humphreys of Tennessee, 1862; President Andrew Johnson, 1868; Secretary of War William R. Belknap, 1876; District Judge Charles Swayne of Florida, 1905; Associate Judge of the Commerce Court, Robert W. Archbald, 1912; District Judge Alston G. Dayton of West Virginia, 1914; District Judge George W. English of Illinois, 1926; District Judge Harold Louderback of California, 1933; and District Judge Halsted L. Ritter of Florida, 1936. The only verdicts of guilty secured were in the trials of John Pickering, West H. Humphreys, Robert W. Archbald, and Halsted L. Ritter.

Impedance (*ĭm-pē'dăns*), the effectiveness of an alternating current circuit in limiting the flow of electricity. The impedance is equal to the ratio of alternating potential difference to current and is expressed in ohms. It depends upon the resistance, inductance, and capacity of the circuit and also upon the frequency of the alternating potential difference applied. Minimum impedance occurs at a condition known as *resonance* and results in maximum flow of current in the circuit.

Imperative (*ĭm-pĕr'ə-tĭv*), in grammar, form of the verb which expresses a command, *e.g.*, Look! Come!

Imperator (*ĭm-pē-rā'tōr*), the term applied

to a military commander in ancient Rome. During the time of the republic the term imperator followed the name, but when the empire was organized it was changed to *emperor* and as a title preceded the name of the supreme ruler. The title became extinct with the fall of the Byzantine realm in 1453. The term imperator was applied to triumphant generals throughout the Empire. Charlemagne, the founder of the German Empire, assumed the title of emperor.

Imperfect (*im-pĕr'fĕkt*), in grammar, tense of a verb denoting a continuing action, most commonly an incomplete past action, as "he was playing."

Imperial Conference (*im-pē'ri-al*), since 1907, a British congress of representatives of the United Kingdom and the self-governing Dominions, held about every four years, and headed by the Prime Minister of Great Britain. Since 1917, India has also sent delegates, as did Southern Rhodesia in 1932. Between meetings a permanent secretariat is in charge of affairs. Having no actual legal weight, the resolutions and findings of these conferences, concerning foreign policy, Empire defense, economics, Dominion status, etc., often has greatly influenced British Empire policy. An outstanding example of this was a committee's study, during the 1926 Conference, of the relationship between the United Kingdom and the Dominions; final results brought about an equal footing for the Dominion parliaments with the Parliament of the United Kingdom (enacted on Dec. 11, 1931, as the *Statute of Westminster*. Since 1924, there has been a standing committee to deal with economic problems.

Imperialism (*im pē'ri al izm*), the policy of territorial extension by conquest, the spirit of empire, or the system of government under an emperor or empress.

In ancient times the territorial conquests of many empires included a large part of the known world. The Assyrian empire endured from about 750 to 612 B.C., and the Persians ruled the civilized East from 550 to 330 B.C. Armies of the Roman republic conquered the entire Mediterranean World, and, under the Caesars, Roman imperialism spread even farther until the empire disintegrated in the 5th century A.D.

In modern times, imperialism is associated with the conquest of territories outside of Europe. The first wave of imperialist activity followed the Age of Discovery, when Portugal, Spain, Holland, France, and England established trading posts in the Far East and acquired colonies in America. With the decline of mercantilist policies in the 18th century and England's loss of colonies in the American War for Independence, imperialist activity overseas became less popular, although it did not cease.

About 1870 there was a resurgence of overseas colonization, sometimes called "neo-imperialism." It is associated with the requirements of Europe's new industrial economy—for more markets, for new raw materials, and for places to invest surplus capital. During the 1880's European countries parceled out almost the whole of Africa. Immediately thereafter, they sought naval bases and spheres of influence in China. Following World War II, the imperial rule of many European countries in Asia was challenged by the demands of colonial peoples for self-government and independence. This was especially true in India, Java, and Indo-China.

At the close of the 18th century in Europe, French revolutionary armies under Napoleon overran the continent until defeat brought an end to Napoleon's imperial dream in 1815. The spirit of Napoleon was revived by his nephew, Napoleon III, French emperor from 1851-70. In France, the term imperialism specifically implies the Napoleonic empire and tradition.

In America, the term imperialism is sometimes used to describe American expansion westward across the continent, the War with Mexico, the annexation of Texas and Oregon Territory. Such expansion was primarily agricultural, to provide land for new settlement. The term imperialism usually refers to activities of the U.S. government and American businessmen in acquiring naval bases, political dominion, and economic influence in areas outside the continental U.S.

There was abortive agitation to purchase Cuba from Spain in the 1850's. Secretary of State Seward arranged the purchase of Alaska from Russia in 1867, but his effort to buy the Virgin Islands from Denmark was blocked by Congress. Imperialism as a force in American history did not begin until the 1890's, when the acquisition of territories beyond the sea reflected America's new position as a world power.

The popularity of naval expansion, and the idea that America's manifest destiny lay beyond the sea, led, in 1898, to a war with Spain, ostensibly to free Cuba. By the Treaty of Paris, however, the U.S. acquired the Philippine Islands, Guam, and Puerto Rico (1898). Hawaii was annexed in the same year. Opposition to America's new role played a large part in the election campaign of 1900, but the anti-imperialist forces, led by William Jennings Bryan, were defeated.

During the first two decades of the 20th century, the U.S. intervened frequently in Caribbean countries. President Theodore Roosevelt's administration fostered a revolt in Panama, established a protectorate over the new country (1903), and began construction of the Isthmian Canal. The Department of State encouraged bankers to lend money to Latin American governments and helped businessmen to win concessions (the so-called "dollar diplomacy"). Whenever American

for new industries, artists, domestic servants, or assistance in emigration on the part of friends or relatives. The so-called "Gentlemen's Agreement" of 1907 between Japan and the U.S. forestalled impending American legislation by providing that no Japanese laborers headed for the U.S. might receive passports from their government. The Immigration Act of Feb. 5, 1917, raised the mental, physical, moral, and economic standards for immigrants and practically closed the door on Oriental immigration; it was vetoed by President Wilson, but became the basic immigration law.

The First Quota Act of May 19, 1921, was the first numerical restriction of immigration. The 1921 act was a temporary, emergency measure designed to restrict the high flow of immigration following World War I. The annual quota was 357,803 for Europe, Africa, Australia, and a large portion of Asia. The quota of any nationality was limited to three per cent of the foreign-born of that nationality resident in the U.S. as shown in the census of 1910. This law expired on June 30, 1924.

The Immigration Act of May 26, 1924, replaced the First Quota Act. The new law limited immigration from all countries except the independent countries in the Western Hemisphere to 164,667 immigrants per year. This law carried two bases for determining quotas. An interim formula was used in the years 1925 to 1929; it provided for a quota based on two per cent of the foreign-born who were resident in the U.S. as determined by the 1890 census. This formula changed the quota bases from the 1910 census, the time when immigration from Southern and Eastern Europe was at its height, to the 1890 census, when immigration from Northern and Western Europe was predominant. This change permitted more immigrants to be admitted from Northern and Western Europe. In the five-year period 1925 to 1929, when the 1890 census quota base was in use, quota fulfillments averaged 92.5 per cent per year.

Under the National Origins Provision of the Immigration Act of 1924, which became effective July 1, 1929, the annual quota was reduced to 153,714. The quota of each nationality was determined on the basis of the national origin of the total white population as enumerated in the 1920 census. There were a few changes in quotas occasioned by a reallocation of political boundaries or by the establishment of quotas for citizens from previously barred zones since that first proclamation. The act exempted from the quotas alien wives and children of U.S. citizens, professors, and ministers, and their families, and natives of the independent countries of the Western Hemisphere.

In 1940 the Alien Registration Act was passed, requiring resident aliens and aliens visiting the U.S. for 30 days or more to be registered and fingerprinted. This act was amended in 1950 by the Internal Security Act which requires that each resident alien should report his current address yearly, during the first ten days of January. The 1940 act also prohibited certain subversive activities and strengthened existing laws on admission and deportation. In 1941 an act was passed against the admission of aliens dangerous to the public safety.

Following World War II legislation was passed facilitating the admission of special groups of immigrants—the War Brides Act of Dec. 28, 1945. The War Brides Act not only facilitated the entry of the alien spouses and alien minor children of citizen members of the armed forces of the U.S. by removing the requirements for a visa petition prior to the issuance of a visa, but extended nonquota privileges to aliens admitted to the U.S. on a temporary basis who were married to members of the armed forces.

The Displaced Persons Act of 1948, as amended on June 16, 1950, provided that a total of 341,000 refugees and displaced persons could be admitted to the U.S. during a three-year period beginning July 1, 1948. In addition, 54,000 persons of German ethnic origin who resided in the Western zones of Germany and Austria on Jan. 1, 1949, could be admitted, as well as minor groups of special categories. The Refugee Relief Act of 1953 provided for the entry of 214,000 refugees and displaced persons annually.

The Internal Security Act of 1950 amended a number of preceding immigration laws by strengthening the provisions applying to subversive activities. The law specified that aliens would be excluded from the U.S. who had been in any sense affiliated with ideologies inimical to national security, and tightened the provisions relating to deportation of aliens who hold subversive beliefs.

The immigration laws were revised and codified in the (McCarran–Walter) Immigration and Nationality Act which went into effect on Dec. 24, 1952. The act removed racial bars to immigration; Asiatics, including Japanese, could be admitted to the U.S. for permanent residence. Grounds for the exclusion of criminal aliens were broadened. A more thorough screening of aliens, especially of security risks and subversives, was provided for. The practice of classifying aliens as nonimmigrants (aliens who seek to enter for temporary periods of stay) or immigrants was continued under the 1952 act.

The new law substituted a mechanically simplified formula for determining the annual quota for each quota area (the term "quota area" was substituted for the term "nationality," as being more appropriate). This formula provided that the quota for each quota area should be one-sixth of one per cent of the number of inhabitants in the continental U.S. in 1950 who were attrib-

utable by national origin to that same quota area.

To achieve more selective immigration, the new act gave a special preference in the issuance of quota immigration visas to aliens with skills urgently needed in the U.S. Safeguards designed to prevent the separation of families were also incorporated in the new law, and previously existing inequalities in the law in the treatment of the sexes were removed.

In 1960 the foreign-born constituted 5.4 per cent of the total population of the U.S. The countries of birth of the majority of foreign-born whites were represented in 1960 as follows:

COUNTRY OF ORIGIN	NUMBER	PERCENTAGE OF TOTAL FOREIGN-BORN
Italy	1,255,480	13.5
Germany	984,289	10.6
Canada	938,866	10.1
Great Britain	828,742	8.9
Poland	747,060	8.1
U.S.S.R.	689,170	7.4
Mexico	572,420	6.2
Denmark, Norway, and Sweden	450,136	4.8

The table below shows the immigration into the U.S. for each decade since 1821.

DECADE	IMMIGRANTS	POPULATION AT BEGINNING
1821-1830	143,439	9,633,822
1831-1840	599,125	12,866,020
1841-1850	1,713,251	17,069,453
1851-1860	2,598,214	23,191,876
1861-1870	2,314,824	31,443,321
1871-1880	2,812,191	38,558,371
1881-1890	5,246,613	50,155,783
1891-1900	3,687,564	62,622,250
1901-1910	8,795,386	76,303,387
1911-1920	5,735,811	91,972,266
1921-1930	4,107,209	105,710,620
1931-1940	528,431	122,775,046
1941-1950	1,935,039	131,669,275
1951-1960	2,515,479	150,697,361

The following table shows the population and foreign-born inhabitants for each year stated:

YEAR	FOREIGN-BORN	POPULATION
1850	2,244,602	23,191,876
1860	4,138,697	31,443,321
1870	5,567,229	38,558,371
1880	6,679,943	50,155,783
1890	9,308,104	63,069,756
1900	10,460,085	76,303,387
1910	13,515,886	91,972,266
1930	13,920,692	122,775,046
1940	11,419,138	131,669,275
1950	10,161,168	150,697,361
1960	9,738,143	179,325,671

Immortality (*im-ôr-tăl'i-ti*), the continuation of individual life after death. In philosophy and religion there are two entirely different concepts of immortality. One, which may be called the *religious* concept, is always associated with certain general religious beliefs. The other, which may be called the *rational* concept, is not allied with any general religious or philosophical system.

The rational concept is based on a number of approaches. One approach states that since, according to natural science, matter cannot vanish, and the individual human being is composed of matter, the substance of the individual is preserved. Materialists (*q.v.*) and monists (*q.v.*) are satisfied by this explanation. Another belief holds that the individual human being is continued by his offspring, or by his social influence, as represented by creative works, new institutions, laws, and so on. This concept of immortality supposes an eternal duration of the physical earth, the human race, and its social institutions. The third approach to the rational concept of immortality is based on the supposition of the eternal duration of certain abstract values, such as good, truth, and beauty, which transcend the individual mortal life. Here, there is the philosophical problem of whether or not these abstract values would exist if there were no human beings to conceive of them. Philosophers have answered this question in different ways. If the answer is in the affirmative, then certainly one may speak of immortality, but not of personal human immortality.

The various concepts of rational immortality are regarded by some as representing escapist constructions. They hold that each individual must have the courage to make the only relevant decision as to whether or not he believes in individual metaphysical immortality or not, and that the three concepts mentioned above will not help him to evade this question.

Basically, the beliefs in survival after death and in the transmigration of souls belong to the metaphysical concept. Indian religious systems are, therefore, as far away from the rational concepts as the Christian and Mohammedan systems are.

The proof of immortality has been attempted essentially in four different ways: (*a*) The ontological argument (*q.v.*) deduces immortality from the fact that the soul is immaterial, simple, and independent of the body, and that it knows eternal truth. (*b*) The teleological proof is based on the idea that the goal of the individual being is to become more and more perfect and more and more independent of external conditions (limitations of time and space), and that such a goal obviously cannot be achieved on this earth (see also *Teleology*). (c) The theological proof is based on the conviction of the wisdom and justice of God who would permit us to realize His qualities, but not on this earth. (*d*) Most convincing for most people is the historical argument which states simply that the belief in immortality is common to almost

Courtesy The Bettmann Archive

AUSTRALIA CLAIMED FOR GREAT BRITAIN

A strong link in the chain of the British Empire, on which for centuries "the sun never set"

investments were in danger, diplomatic pressure was brought to bear. If peace were disturbed, the Marines landed to take the situation in hand. In this way virtual protectorates were established over Santo Domingo (1907), Haiti (1915), and Nicaragua (1916). Marines stormed Vera Cruz in 1914 to compel the resignation of a Mexican president, and American soldiers advanced into Mexico in 1916, pursuing a Mexican bandit. The Virgin Islands were purchased in 1917.

The fruits of this policy were ill will all over Latin America, and it was gradually reversed. Marines were withdrawn by 1933, and in that year President F.D. Roosevelt declared American policy to be that of the "Good Neighbor." The U.S. renounced intervention as a national policy in Latin America, and in 1934 the government surrendered its right to intervene in Cuba.

In the Philippines, American soldiers spent three years quelling a rebellion that followed annexation. Despite improvements in transportation, sanitation, and education, the Filipinos continued to demand freedom. Democrats and the Farm Bloc generally favored Filipino independence, while navy supporters and some politicians opposed it. In 1934, the Tydings-McDuffie Act, a bill providing for the gradual emancipation of the islands, was passed by Congress and accepted by the Filipino legislature. Independence was necessarily postponed when Japan occupied the Philippine Islands during World War II, but it was finally consummated on July 4, 1946.

American interests in the Pacific received new impetus in the war against Japan. Although the Philippines were freed, the U.S. retained naval bases there, and popular demand for naval bases elsewhere in the Pacific remained strong.

In Leninist and contemporary Russian literature, imperialism denotes the final, declining stage of capitalism, during which monopoly tends to supplant free competition, and capitalism, according to communist theory, ceases to be a progressive force providing for the constant expansion of production. During this stage of "dying capitalism" bourgeois governments are said to become more reactionary, and capitalist rivalry results in efforts to exploit backward countries for monopolistic purposes. While Leninists condemned imperialism as a manifestation of dying capitalism, Soviet Russia practiced it in the name of Communism. Russia annexed (the official explanation was "liberated") the Baltic states during World War II, and set up satellite states in Poland, Hungary, and Rumania (*qq.v.*) at the war's end. Native Communists advanced Russia's imperialist interests when backed by Soviet armies, but Soviet imperialism met stiff opposition where Russian troops were not present, as in Greece and Iran (*qq.v.*). Satellite Communist armies served Russian interests in China (*q.v.*) where, with the Kremlin's backing Communist forces conquered all of China, and invaded

THE AGE OF IMPERIALISM

In the late 19th century the pattern of European imperialism took shape in Asia and Africa. China was opened to European commerce in 1858 with ratification (*above*) of the treaty of Tientsin with England and France. Germany's expansionist ambitions were typified in the visit of Kaiser Wilhelm II (*above right*) to Damascus, Syria, in 1898. In the Western Hemisphere, the U.S. raised the Stars and Stripes on Cuban soil (*right*) in 1898, during the Spanish-American War (*photos courtesy The Bettmann Archive*). Japan's modern effort toward imperialism began with the seizure of Manchuria, including Harbin (*below*), in 1932. After World War II, the U.S.S.R. achieved the political capture of its European satellites, including Czechoslovakia (*below right*) in 1948

the Republic of Korea (*q.v.*) in June 1950.

Imperial Valley, an area of more than 1,000,000 acres, located in Imperial County, Southern California. Formerly dry desert land, today over 600,000 acres are under irrigation supplied by water from the Colorado River. The tropical climate and the irrigation system together afford year-round production of citrus fruits, lettuce, tomatoes, flax, alfalfa, etc.

Impressionism (*im-prĕsh'ŭn-ĭz'm*), the name applied to a school of painting whose aim is to produce works of art in exact accord with nature, more especially, the surface of things and the interplay of light and shadow. The painters of this group are usually called *impressionists,* since they seek to reduce to the canvas an exact impression of their subjects, so they will impress the mind in a way similar to the object or scene painted. From this circumstance they are sometimes called *naturalists,* owing to the fact that they seek to reproduce according to nature though emphasizing the visual impression of the surface only. Formerly these terms applied more particularly to painters, but now they are used likewise in reference to sculpture and literature. In literature, impressionist writing implies exact description of transitory situations, thus devising a story from a series of single impressions.

The painters of this school oppose the practice of painting in the studio, because they think it gives untrue tones, but instead do their painting in full light. While the naturalist school in painting at the beginning of the 19th century was only naturalistic and no more, it did pave the way for Impressionism. The two leading masters of naturalism were, in France, Jean-Baptiste Corot (*q.v.*); in England, John Constable (*q.v.*). The pioneer of Impressionism proper was Édouard Manet (*q.v.*); among the leading masters were Claud Monet, Edgar Degas, and Auguste Renoir

IMPRESSIONISM

Mme. Charpentier with Children. Painting by Pierre Auguste Renoir (1841-1919)

Metropolitan Museum of Art, N. Y.

(*qq.v.*). The movement represents the climax of 19th-century painting. See also *Art* and color plate, *Great Paintings II*, in volume XII.

Impressment (*im-prĕs'mĕnt*), the act of impressing persons into public service, or of seizing property for public use. Formerly the power of impressment was claimed by many governments, but since the War of 1812 it has been abandoned by most countries. The British government claimed the right of searching American vessels prior to the War of 1812, and of impressing into service British seamen who were employed under the American flag. At that time England was at war with France and claimed the service of all her maritime citizens, refusing to recognize allegiance to the U.S. even by naturalization. The willful impressment of many American sailors was instrumental in bringing about the embargo system and the War of 1812.

Inagua (*ē-nä'gwä*), GREAT and LITTLE, the names of two islands in the West Indies, belonging to the Bahama group. Great Inagua, the larger of the two, is located 60 m. N.E. of Cuba and has an area of 660 sq. m. Little Inagua, located 10 m. N.E. of Great Inagua, has an area of 35 sq. m. Total population, 1943, 890.

Inauguration Day (*ĭn-ô-gū-rā'shŭn*), in American history, the day on which the President and Vice President are inducted into office, occurring once every four years. Inauguration Day is considered a legal holiday only in the District of Columbia. Formerly on March 4, since 1937 it has taken place on January 20. See *Lame Duck Amendment*.

In Bond (*ĭn bŏnd*), a term used in economy, denoting held under bond or in trust.

Inbreeding (*ĭn-brēd'ing*), the mating of individuals related in some degree through one or more common ancestors. The closest form of inbreeding possible is found in some plants and in hermaphroditic animals where both types of germ cells are produced by the same individual and self-fertilization occurs. In bisexual forms, the mating of full brother and sister is the closest form of inbreeding.

Inca (*ĭn'kä*), the name of the governing class of the Peruvian Indians, and later the title of the chief or imperial head of the empire of Peru. The Incas ranked with the Aztecs and the Mayas in the scale of intellectual and industrial advance-

INCA SUN DIAL

Courtesy Grace Line

ment. Their territory extended from the Equator southward a distance of about 38°, and embraced the Andean region south of the Equator and much of the slope toward the east, extending far into the valleys of the Amazon and the Orinoco. Their capital was at Cuzco until a short time before the Spanish conquest, when it was removed to Quito by Atahualpa. At that time the Incas were highly developed in agriculture and fruit raising. They maintained a considerable commerce, manufactured clothing and implements, promoted mining, and had a substantial architecture. The Peruvians originated civil and social institutions of much perfection. They were finally conquered by the Spaniards in 1532, when their empire had a population of about 10,000,000. Many relics of Incan architecture are found in Peru and other countries of South America. They constructed of adobe bricks and of stone, built aqueducts and waterways, and attained to much proficiency in embalming and entombing the dead. Many of the people of the Andean countries of South America trace their ancestry to the Incas.

Incarnation (*ĭn-kär-nā'shŭn*), a term meaning the manifestation of any divine being in human form. The concept of incarnation may be found in many religions; particularly in Buddhism (*q.v.*) and in Brahmanism (*q.v.*) there is a belief in the reincarnation of Vishnu (*q.v.*) in addition to the belief in the reincarnation of Brahma himself. The incarnation of God in Christ represents the essence of Christian belief. The doctrine is clearly stated in the first Chapter of the Gospel according to John (1:32): "I saw the Spirit descend from heaven like a dove, and it abode upon him." At the same time John says (1:14): "And the Word was made flesh and dwelt among us. . . ." Since the Word has existed from the beginning and is identical with God, this statement means the "incarnation." This mystical union of man with God is one of the main problems of Christian theology. The controversy is and has always been as to whether Christ is identical with God, or only similar to God, or different from God. See also *Arius; Nice, Council of; Athanasianism.*

Incense (*ĭn'sĕns*), an aromatic substance which emits a sweet odor when burned. Perfumes of this kind have long been used in religious rites. The substance employed consisted anciently of a mixture of gums, spices, and balsams, which form a large portion of the ingredients still used. Among the Jews incense was burned on a special altar, called the *altar of incense.* They employed it only as an act of worship and not as a sacred offering. The worshiping of gods in ancient Assyria, Babylonia, Egypt, India, Greece, and Rome included incense-burning daily, usually in the morning and evening. It is still employed by the adherents of divers religions of Asia, especially by the Buddhists. The Greek and Roman churches both employ incense in worship, especially in the most sacred services, such as high mass, in funerals, and the consecration of churches.

Incineration (*ĭn-sĭn-ĕr-ā'shŭn*), the act of burning to ashes (from the Latin *cineris,* ashes). It differs from simple burning in that the combustion is complete and the residue is ashes, even of such difficult materials to burn as bones, and metals of reasonably low melting points. Incineration depends on the achievement of high temperatures and the complete oxidation of materials. This is accomplished by use of a furnace, or oven, insulated against the rapid loss of heat by radiation and conduction. Thus the accumulated heat raises the temperature of the materials being consumed. Sufficient air to insure complete combustion is also necessary; this may be supplied by a long draft or by air blowers. The heat supplied may be produced by the burning of oil, coal, gases, or by electricity. Incinerators are frequently built into hotels, apartment houses, and homes, as a sanitary measure to dispose of all kinds of refuse, including bottles and cans. The special furnaces or ovens used for the cremation of bodies may also be called incinerators.

Inclined Plane (*ĭn-klīnd' plān*), any plane surface that makes an angle with a horizontal surface, used for raising heavy weights. If a ball is placed upon a horizontal plane, it retains its position and presses upon the plane with its entire weight. However, as soon as one end of the plane is raised, the entire weight of the ball will not rest upon the plane and it will begin to roll toward the lower end. It is one of the machines designed to use force advantageously, as in loading a barrel upon a wagon, when one end of a plank may rest upon the ground and the other upon the wagon, and the barrel may be rolled over the plank to much better advantage than in lifting it direct. In railway and highway construction, steep grades are avoided by building the roadways in a winding position around a hill.

Income Tax (*ĭn'kŭm tăks*), a tax measured by income and levied upon individuals, corporations, and other income-receiving units.

The income tax may be applied to the entire income from whatever source derived, or may be restricted to income from special sources, such as wages and salaries or interest and dividends. It may differentiate among incomes from various sources by applying different rates, allowing different exemptions, or by some other method. It may provide a schedule of rates which increase progressively as the amount of income increases, or it may tax all incomes at a flat rate.

The basis of the income tax is generally total income (other than items specifically excluded,

such as gifts), less deductions for expenses incurred in acquiring or producing income and certain other allowable deductions. The current Federal Revenue Act provides for personal exemptions, income splitting (married couples filing joint returns may divide their combined incomes equally in computing income taxes), a standard deduction (instead of deductions for donations, personal interest, certain taxes, and medical expenses).

The individual net income tax, particularly when levied at progressive rates, is generally regarded as one of the best forms of taxation. Usually mentioned among its desirable features are its reliance upon net income as a measure of ability to pay and its certainty of incidence. Some observers regard the progressive income tax as a means of reducing inequalities in the distribution of wealth. In recent years, increasing recognition has been given to the economic effects of the tax, such as its effect upon purchasing power, savings, economic incentives, and levels of economic activity.

In the U.S., the first Federal individual income tax was imposed in 1861 as a war revenue measure and repealed about 10 years later. Again in 1894, the Congress enacted an income tax, applicable to both business and personal income, but the U.S. Supreme Court declared it unconstitutional on the grounds that a tax on income from real and personal property is a direct tax which must be apportioned among the states in proportion to population. In 1909, Congress enacted a corporation excise tax measured by net income which was sustained by the Supreme Court. At the same time, a Constitutional amendment which would permit Congress to levy an income tax without apportionment among the states was submitted to the states. When the Amendment (the 16th) was finally ratified in 1913, Congress immediately enacted a general income tax, applicable to both individuals and corporations.

Since 1913, the Federal income tax has undergone various structural changes, as well as numerous changes in the rate schedule and has become the most important source of Federal revenue. During the five war years, 1941-45, the individual income tax alone brought in more revenue than any other single tax source.

The broadening of the individual income tax base by wartime revenue measures resulted in an increase in the number of taxpayers from 8,000,000 in 1940 to 48,000,000 in 1945, but decreased again in 1948 because of increased personal exemptions. With this development, basic changes were made in collection methods and filing procedures. A system of current payment, including the withholding by employers of tax on salaries and wages (pay-as-you-go plan), and the estimating and current quarterly payment of taxes not collected by withholding, was introduced in 1943. A comprehensive simplification program adopted in 1944, included, among other features, a provision that wage earners may file the withholding receipt as a tax return and have their tax computed by the collectors of internal revenue.

Although the states had levied income taxes prior to the entrance of the Federal Government into this field of taxation, the early state income taxes were poorly administered and produced little revenue. The modern state income tax with central administration by a state tax commission began with the Wisconsin income tax law of 1911. Currently individual net income taxes are imposed by 29 states and the District of Columbia. In addition to the general income taxes, four states tax incomes from intangibles. Corporate net income taxes are imposed by 31 states and the District of Columbia.

The first municipal net income tax in the U.S. was imposed by Philadelphia in 1939. A low flat rate is applied to wages, salaries, and other compensation, and net profits of professions and unincorporated businesses. In 1946, Toledo, Ohio, enacted a similar tax but extended the base to include net income of corporations.

Incubation (*ĭn-kū-bā'shŭn*). See *Egg; Incubator*

Incubator (*ĭn'kū-bā-tĕr*), a machine used for hatching eggs by artificial heat. Various forms have been manufactured. Incubators are divided into a number of chambers suitable to receive the eggs and the heat is furnished by a lamp, which either warms the air directly or conducts it to a reservoir filled with water, whence the warm water is conducted by pipes so as to maintain the temperature uniformly. The proper temperature ranges between 90° and 100° F. A somewhat higher temperature is necessary during the first week, after which it should be lowered gradually. The eggs should be turned frequently during the first few days of incubation, and a thermometer should be adjusted so as to permit observing the temperature at any time. The incubators in use range in size from a capacity of a few dozen eggs to several hundred. About 80 per cent is the average hatch of fertile eggs, but to obtain the best results much experience and careful attention to details are required.

Incubus (*ĭn'kū-bŭs*), a male sprite or demon connected with the superstition of the Middle Ages. It was commonly believed that these demons were the cause of *nightmare*. The corresponding female demon was known as *succubus*.

Incus (*ĭn'kŭs*), Latin, meaning anvil, in anatomy, name of the middle bone of the three small bones in the middle ear, so called for its resemblance in shape to an anvil.

Indefinite (*ĭn-dĕf'ĭ-nĭt*), in grammar, form of adjectives, pronouns, etc., not definitely defin-

ing that to which the word refers, *e.g.*, some, any, etc.

Indenture (*ĭn-dĕn'tūr*), a deed executed between two persons, called the *grantor* and *grantee*, respectively; also a legal instrument binding a servant to his master. In American colonial history servants were hired for conditional servitude under indenture. Such servants were called *indentured servants.*

Independence (*ĭn-dē-pĕnd'ĕns*), county seat of Buchanan County, Iowa, on the Wapsipinecon River. It is on the Illinois Central and the Chicago, Rock Island & Pacific R.R.'s. The surrounding country is farming and dairying. It is the seat of the state hospital for the insane. Population, 1940, 4,342; in 1950, 4,865.

Independence, county seat of Montgomery County, Kansas, 85 m. s.w. of Ft. Scott, on the Missouri Pacific and the Santa Fe R.R.'s. The surrounding country is agricultural and stock raising, and produces oil and gas. The manufactures include cement, oil by-products, automobile oil filters and accessories, oil-field equipment, laminated wood products, washing machines, and dairy products. Population, 1950, 11,335.

Independence, a city of Missouri, seat of Jackson County, 8 m. E. of Kansas City, Mo. (*q.v.*), on the Gulf, Mobile and Ohio and the Missouri Pacific R.R.'s. The city's products include flour, farm machinery, petroleum, cement, luggage, and metal goods. Among the notable buildings are the first Jackson County courthouse (a log building), the home of Harry S. Truman, 33rd President of the U.S., and the Truman Library. In 1831 Joseph Smith and his followers established a church here (see *Mormons*). A remaining group established the world headquarters of the Reorganized Church of Jesus Christ of Latter Day Saints in Independence (see *Latter Day Saints*). First settled in 1827 and chartered as a city in 1849, Independence was located on the Santa Fe, Oregon, and California Trails and became important as a supply center to westbound pioneers. Population, 1950, 39,963.

Independence Day, the national holiday of the U.S., celebrated on the 4th of July in commemoration of the signing of the Declaration of Independence (*q.v.*).

Independence Hall, a building erected between 1729 and 1734 as a meeting hall on Chestnut St., Philadelphia, Pa. In 1775 it was the meeting place of the Continental Congress, when Washington was made commander-in-chief of the American army. On July 4, 1776, that body adopted the Declaration of Independence, which was read to a vast public assemblage in the street. The structure is of brick, though much of the woodwork and finishing has been replaced or restored. It is now used as a museum of historical relics and is open to the public.

Independents (*ĭn-dē-pĕnd'ĕnts*), the name of a Protestant sect originating in England in the 16th century. Robert Brown, an English clergyman, organized the sect in 1586, and for some time they were known as Brownists or Separatists. They included those Protestants who believed that each individual church should administer its own affairs, instead of being under the authority of a civil or ecclesiastical official or potentate. Later the members were merged largely with the Congregationalists, who have a strong following both in England and America at the present time.

Index Librorum Prohibitorum (*ĭn'dĕks lī-brō'rŭm prō-hĭb-ĭ-tō'rŭm*), the name of a catalogue of books proscribed by the Roman Catholic church, which its members are not permitted to read. Such a catalogue was first prepared by the Council of Carthage in the year 400, but a much larger edition was compiled by the Inquisition at Rome in 1557 under the direction of Pope Paul IV. This work forbade the reading of the works of Luther, Calvin, and other reformers, and later other Protestant authors were placed on the list. Publications relating to some of the sciences and to politics, especially to Communism, were proscribed. Bishops, however, could permit people to read some of the works on the prohibited list, if professional reasons required it. The latest edition of the *Index Librorum Prohibitorum* was issued in 1948, kept up-to-date by supplements.

Index Number (*ĭn'dĕks nŭm'bĕr*), in eco-

INDEPENDENCE HALL

Courtesy R. I. Nesmith & Associates, N. Y.

Photos in this series courtesy Government of India Information Services

HINDU GOD, NATARAJA, 12TH CENTURY A.D.

nomics, a number which is used by statisticians to show the relative change or differences among related data. Index numbers are usually given with reference to an arbitrary base, generally stated as 100. Index numbers are ordinarily determined by taking the ratio of the data under study for one date as compared to the data in the base period. This ratio is expressed as a percentage. Thus, if the present price of a given item is $.50, and the average price in the base period, 1935-39 for instance, was $.40, the current index number is 125 (the base period price index number representing 100). The percentage sign is usually omitted. Index numbers are used in reporting a wide variety of statistics, including prices, wages, and production.

India (*in′dĭ-ȧ*), part of the continent of Asia, bounded by Baluchistan and Afghanistan to the N.W., Tibet and China to the N., and Burma to the N.E. Peninsular India has the Bay of Bengal to the E. and the Arabian Sea to the W. The name is derived from the Sanskrit *Sindhu,* corrupted in ancient Greek to *Indos,* the name of the River Indus. Formerly, the names *Hindustan* (country of the Hindus) and *Aryavarta* (land of the Aryas) were also used extensively, although the terms originally referred mainly to northwest India. The greatest length of the region, from Cape Comorin at the tip of the peninsula to the Karakoram Mts. in the north of Kashmir, is

about 1,900 m., and its greatest breadth, from the Baluchistan border to the Burmese frontier, over 2,000 m. The area is 1,581,410 sq. m. With the exception of the Princely States, it existed as an empire under the British Crown from 1857 to 1947, when it was subdivided into the Dominions of India and Pakistan (*q.v.*).

The Republic of India, a Dominion from 1947 to 1950, comprises the central, extreme northwestern, and extreme northeastern portions of the former empire. It is bounded on the N. by Pakistan, Sinkiang, Tibet, Nepal, and Bhutan; on the S. by the Indian Ocean; on the W. by the Indian Ocean, Arabian Sea, and Pakistan; on the E. by Burma, the Pakistan province of East Bengal, and the Bay of Bengal. New Delhi (pop. 1,743,992) is the capital. The area is *ca.* 1,221,000 sq. m.; population, *ca.* 361,082,000.

Physical Features. The region is separated from the rest of Asia by the great ranges of the Himalayas, Hindu Kush, and Sulaiman Mts. The surface is naturally separated into three vast regions. In the southern portion is the tableland of Deccan, with a general elevation of from 1,800 to 3,000 ft.; north of it is the Great Plain, which is the most fertile and populous region; and the elevated highlands of the Himalayas, which comprise the northern part. These mountains are the loftiest in the world, many of the peaks rising to heights of from 20,000 to nearly 30,000 ft. above sea level. Mount Everest, the highest of the Himalayas, is the giant among the mountains of the world. The Hindu Kush ranges extend westward from the Himalayas, and the Sulaiman and Hala Mts. stretch southward along the western border. These mountains can be crossed by passes which are sometimes as high as 18,000 ft. above the sea. The drainage is generally toward the south, being toward the southwest in the western part and toward the southeast in the eastern section.

The Brahmaputra and the Ganges (in Hindi, *Ganga*) are the largest rivers. They drain the northeastern section. They have their sources on the southern slopes of the mountains, where the rainfall is heaviest, and they carry an immense volume of water in proportion to their length and the basins drained. Both discharge by many mouths into the Bay of Bengal, where they have deposited an immense quantity of silt. In the northwestern part are the Chenab and the Sutlej Rivers which, together with the Ravi, meet the Indus River in Pakistan. The Indus drains an immense basin into the Arabian Sea, which it enters by an extensive delta. Among the rivers of the peninsula are the Narbada and Tapti, flowing into the Arabian Sea; and the Godavari, the Kistna, and the Cauvery, discharging into the Bay of Bengal: The Jumna (*Yamuna*), a tributary of the Ganges, drains a large portion of the central plain. As a whole the coast line is

quite regular and not deeply indented, the largest inlet being on the western shore and including the Gulf of Cutch and the Gulf of Cambay. Two large lakes are Kolar and Chilka, both located on the eastern coast.

Climate. In most parts of the region the climate is tropical, with two distinctive periods, the rainy season and the dry season. The rainy season in most parts is between June and September, but the distribution of humidity is more or less irregular, so that droughts are not infrequent. In the summer or dry season the heat is very great, especially in the southern portion, but the elevated interior and the mountains in the north have a moderate climate. A marked influence is exercised by the monsoons, moisture-laden wind-currents from the Indian Ocean which blow across the country, strike the mountain ranges, and precipitate heavy rains. The hottest part of the country is in the northwest, in the region of the Indian Desert, where mean temperature for July is about 96° F. The climate is generally healthful, except in the jungle and marshland along the coast and in the lower courses of the larger streams. The annual precipitation at Madras is 50 in.; at Bombay, 72 in.; and at Calcutta, 63 in. The heaviest rainfall occurs in Assam, where the precipitation ranges from 500 to 600 in. per year.

Flora and Fauna. The vegetation is diversified according to elevation and the distribution of rainfall. Desert conditions prevail in the region lying east of the Indus, in the vicinity of the Gulf of Cutch, where plant life is very scant. Dense jungles are located along the Gulf of Bengal and in the lower course of the Ganges, where the plants are numerous and of large size. In the Deccan, east of the Western Ghats, the rainfall is scant, and vegetation is correspondingly limited; in the mountain region the flora is European and Siberian. The alluvial lands of the Indus and the Ganges are very fertile. The principal trees of commercial value are teak, salt, deodar, rosewood, ebony, and sandalwood. Fruit trees abound, especially the mango, banana, and coconut. The fauna of India is remarkably rich and includes the pure Indian type of Peninsular India, the Persian types of northwestern India, the Tibetan and the Malayan. The tiger, many varieties of the bear and the leopard, elephants, monkeys, and many kinds of deer are the most numerous. India never had many lions, and the species is almost extinct there. The rhinoceros occurs in the northeastern jungles but in diminishing numbers.

Agriculture. Throughout history the region has been predominantly agricultural, and the Gangetic plain is the largest continuum of cultivated territory in the world. Even today, over 80 per cent of the people depend on agriculture for a living, making this occupation the dominant factor in Indian economics. One-third of the country's area is cultivated, compared with 18 per cent in the U.S. Cultivation methods are still primitive, but great progress has been made in recent decades. However, in most areas, successful crops depend upon the monsoon rains, and when these fail, widespread famine results. Every district maintains many experts and demonstrators who attempt to introduce scientific methods of farming in place of the traditional. Agricultural colleges and research institutes are maintained by government agencies. Principal food crops in order of importance follow: rice, wheat, jower or large millets, bajra or spiked millets, barley, and corn. Principal non-food crops are cotton, jute, tobacco, indigo, oil-seeds, sugar, tea, and coffee.

The region stands second only to the U.S. with regard to the area and production of cotton; it grows a greater variety of oil-seeds in commercial quantities than any other country; is one of the world's largest producers of tea and supplies 40 per cent of the world demand; has a virtual world monopoly of jute (burlap), and now runs second to the U.S. in tobacco production, although the quality is coarser, and it is used mainly for internal consumption. Improved Virginian tobaccos are now being grown in increasing quantities. The western hill ranges of South India are suitable for rubber growing, but the yield is insignificant. Following the Japanese occupation of Malaya during World War II, intensive efforts were made to increase the rubber acreage. Opium was formerly cultivated in large quantities, and India had a profitable trade in the commodity, but rigorous government control considerably reduced the acreage under cultivation.

RICE CULTIVATION IN INDIA

Over 35 per cent of the land under cultivation is devoted to the production of rice

COTTON MILL IN BOMBAY

Production of cotton textiles is the most important industry in India, the country ranking second only to the U.S. in the cultivation of raw cotton

Stock raising, although important, does not rank high compared with the other agricultural enterprises of India. This is due to various reasons, especially to the facts that people in tropical climates subsist largely on a vegetable diet and that religious beliefs bar Hindus from eating beef and Mohammedans from eating pork. The Hindu regards the killing of cows as a sin. The region has the world's largest cattle population (approximately 205,000,000 head of cattle, over a third of the world total), and it is one of the largest producers of hides and skins. In normal times most of this production is exported. The shoe- and leather-making industry is developing rapidly.

Co-operative movements, which give invaluable assistance to farmers, especially in furnishing cheap credit, were launched in 1904 and have made steady progress. There are over 164,000 societies, most of them agricultural.

Natural Resources. The Republic of India controls by far the larger part of the peninsula's developed natural resources, which include coal, iron ore, manganese, mica, timber, gold, copper, magnesite, and chromite.

Industry. Large-scale industry has made rapid strides since the beginning of the century. The two World Wars gave the movement strong impetus, and special progress was made in the interwar years. Largest of Indian industries is the production of cotton textiles, and a recent year's total production was estimated at 7,000,000,000 yd., which means that India has achieved self-sufficiency, if not a surplus over her own requirements. Contrasted with this position is the fact that in 1914, 60 per cent of the total consumption of cotton textiles in India had to be imported. Large-scale production of iron and steel is forging ahead, and the output in 1948 was 1,527,861 tons of steel. Other important large-scale industries are jute spinning and weaving, cement, sugar, chemicals, tanning, soap, matches, and glass. Engineering workshops, including railway shops, are a substantial item, and production of locomotives is now being undertaken. The electrical, aluminum, and shipbuilding industries are also taking root. Many of these industries were started with British capital, but today British capital is prominent only in the production of tea. The jute industry, for example, was started by Scotch pioneers, but over 70 per cent of the capital of the industry today is Indian.

Transportation. The railroad system is one of the world's largest. Important lines cross the country in all directions, connecting the chief centers of industry and population. Lord Dalhousie originated the policy of railway building in 1853, and private corporations were guaranteed a reasonable interest on their investments. In return the government, from the beginning, exercised powers of supervision and control. This control continually increased and as the contract periods with the railway companies expired, the government assumed direct ownership. There is also an excellent system of roadways. The Republic of India has more than 34,000 m. of railroads and 317,000 m. of roads. Four great trunk roads are linked diagonally across the country, (1) from Amritsar to Calcutta, (2) from Calcutta to Madras, (3) from Madras to Bombay, and (4) from Bombay to Delhi, although some parts of all these routes are liable to flooding during the rainy season. An extensive network of bus services has been developed in recent years. A number of canals provide transportation between some of the principal railway lines, while others connect or supplement rivers. Navigation is possible for long distances on many of the rivers, particularly on the Ganges and Brahmaputra.

Commerce. The region has been important in the commerce of the world from an early period of history. This is due to its production of spices, gems, and high-quality, hand-woven textiles since ancient times, and of vital raw products, such as jute, cotton, hides and skins, and tea in recent times, as well as to its convenient location on the main thoroughfares of ocean transport. Exports in 1949-50 approximated $1,014,741,000 and imports $1,176,042,000. The character of the trade has shown considerable change in recent years because of the gradual industrialization of the country and the increased manufacture of many goods previously imported. The principal imports are cotton, food, machinery, oils, vehicles, instruments and appliances, iron and steel manufactures, chemicals, artificial-silk goods, dyes and colors, and paper. Principal exports are jute manufactures, cotton, tea, raw jute, cotton manufactures, leather, hides and skins, grain, manganese ore, raw wool, mica, tobacco, and lac.

Great Britain has been the region's best customer and is also its first supplier, buying 29% of its exports and supplying 20% of its imports in 1947-48. Pre-World War II trade between the U.S. and India accounted for only about 9% of imports and 12% of exports. The import percentages in 1947-48 and 1948-49 were 30.1 and 17.1, respectively. Export percentages for the same periods were 19.9 and 15.7. India supplies the U.S. with large quantities of mica and manganese. In 1950, out of total manganese exports of 728,000 tons, 530,885 tons went to the U.S. alone.

Population. The population of undivided India in 1941 was 388,997,955, an increase of over 50,000,000 on the 1931 figure of 338,119,154. The corresponding increase in the decade 1921-31 was 32,426,091. Of the total population, 87.2 per cent was rural, while only 49,696,053 lived in urban areas (1941). Millions live in villages of 500 or less. The population of British India was, according to the 1941 census, 295,809,000 and of the Indian States 93,189,000. After the 1947 partition, the population of India was 337,211,000. By 1951 the population had risen to 361,082,000.

The great majority of the population is Hindu, *i.e.*, Indians professing Hinduism. They number 239,427,000, and this figure includes 43,962,000 belonging to the Scheduled Castes known popularly as "untouchables." (The observance of untouchability was abolished in 1948.) The Moslems or Mohammedans number 42,702,000. Christians are estimated at 5,593,000. Another important community, the Sikhs, who profess a distinct reformist creed of Hinduism and are prominent in the East Punjab area, total 4,112,000. There are about 232,000 Buddhists. Parsees number *ca.* 114,800; Jains, 1,434,000; and Jews *ca.* 22,480. There are still many primitive aboriginal tribes living in the hills and jungles, and these totaled 24,819,000 in 1948. There are 58 cities with a population of over 100,000, headed by Calcutta (6,000,000), Bombay (3,000,000), and Madras (1,000,000).

Education. Some 15 languages are spoken by the people of India. These factors, combined with a certain poverty of the country and a resulting low standard of living, have made educational progress peculiarly difficult. Early marriage of women with the consequent dearth of trained women teachers and caste customs such as the segregation of "untouchables" in parts of India (now ended) added to the difficulty.

Although there have been great advances in the extension of literacy, nearly 80 per cent of the Indian people are still illiterate. Education up to the age of 14 has been made compulsory in many parts of the country, and the government is intent on carrying out plans to increase literacy. The first school budget of free India provided $12,000,000, twice as much as any previous educational appropriation. Female literacy lags well behind that of males, less than 10,000,000 of the literates being women. Some 5,000,000 to 6,000,000 persons read and write English.

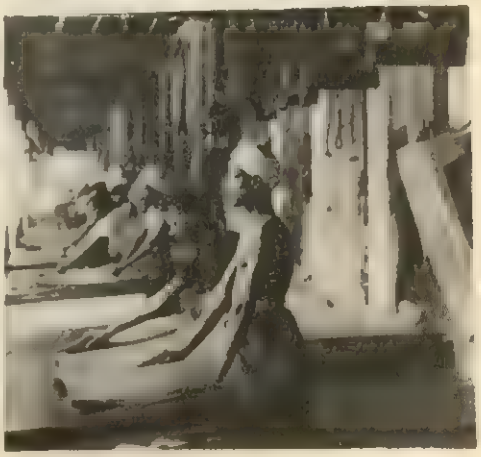
India today has 28 universities, about 450 arts and science colleges, about 150 professional colleges, and about 200,000 grammar and high schools. There are 40 institutions for the education and training of the blind, and some 700 public and school libraries. Various British and American Christian missions have contributed considerably to educational progress with well-staffed schools and colleges.

Government. British administration of India under a viceroy was abolished with the establishment of the Dominions of India and Pakistan. On Jan. 26, 1950, India became the Republic of India, ceasing to be a dominion, but remaining within the British Commonwealth of Nations. The constitution defined India as a sovereign democratic republic with supreme power vested in the people through their elected representatives in Parliament. The government is headed by a president who acts on the advice of ministers who are responsible to Parliament. The organization of the republic is federal, taking the form of a union of states variously classified as provinces, state unions, centrally administered states, or other Indian states. There is a supreme court for the settlement of disputes arising between the central government and the constituent states.

Defense. The armed forces of India were partitioned on communal lines. Today the army has 300,000 men, and the navy 11,850 ratings and officers. In the partitioning of the old navy,

INDIAN LEATHER FACTORY

India is one of the world's largest producers of hides and skins



CANAL BOATS

India received four sloops, 12 minesweepers, one corvette, 13 lesser units. The air force consists of six fighter squadrons and one transport squadron. There is no compulsory military training; all recruiting is on a voluntary basis.

Political Parties and Programs. The history of the Nationalist movement in India may be said to have commenced with the founding (1885) of an organization called the Indian National Congress. In the light of subsequent developments, it is interesting to note that this organization took shape largely through the initiative of a British administrator, Alan Octavian Hume, and with the support of the then viceroy, Lord Dufferin. The name "Congress" does not signify that this organization was some kind of elected legislature. It was, at the beginning, a gathering of politically conscious Indians, and today it is the leading political party in India. In its early years the Congress party demanded representative councils and the appointment of Indians to high administrative positions. In 1908 the organization defined its goal and ultimate objective as full self-government within the British Commonwealth, but the demand was even then only for a gradual development of this objective. It was only after World War I that full self-government was put forward as an immediate demand and it was only as recently as 1929 that the Congress party declared complete independence or *"purna swaraj"* as its creed. From the beginning, the annual conventions of the Congress under eminent leaders, such as G. K. Gokhale and Bal Gangadhar Tilak attracted the support of educated Indians, but the aggressive and dynamic phase of the party commenced in 1920, when it passed under the leadership of Mohandas Karamchand Gandhi (*q.v.*), popularly known as "Mahatma" (Great Soul) Gandhi.

Gandhi brought to the movement a new technique of agitation, and his first campaign (1919) called for a disciplined and nonviolent noncooperation, the idea being that Indians should withdraw all support from the government in every shape and form. The movement, however, soon degenerated into mob riots which shocked Gandhi himself and led to his withdrawing it. He launched his next campaign in 1920, was arrested in 1922, and sentenced to six years' imprisonment, but he was released in 1924. Thereafter, Gandhi developed his technique of civil disobedience which called for formal and nonviolent flouting of the law. His campaign of civil disobedience, intended to paralyze the administration, was launched in 1930. It was suspended after an agreement with Lord Irwin (later Earl Halifax), but was resumed in 1932. In 1942, after the failure of the Cripps mission, Gandhi was about to launch another mass movement when the government arrested him and the other leaders of the Congress party.

Before partition, the Congress party could well claim to be the largest, the best organized, and the best financed of Indian parties. In 1937, it had nearly 3,000,000 registered members. After its success in the elections of that year, the numbers rose to 4,500,000. After the outbreak of World War II the membership showed a decline, and the 1941 figure was 1,543,245. In the 1937 elections, the party won 45 per cent of the seats in all the provincial legislatures, 705 out of 1,585. Since the Congress party creed is purely political, Indians of all religions are entitled to become its members, and a few thousand Mohammedans belong to the party, but the overwhelming majority are Hindus. Besides Gandhi, the Congress party leaders have been Vallabhai Patel, Rajendra Prasad, and Pandit Jawaharlal Nehru. Shri Chakravarti Rajagopalachari, another leader, resigned from the inner councils of the party in 1942, but remained active in public affairs, and now is a minister in the Union government.

Founded in 1906, the Moslem League[1] was for many years the second largest party in the country; it followed a political policy closely parallel to that of the Congress party, but from the beginning it insisted on safeguards to protect the Moslem minority from majority rule by the Hindus.

[1] Also, the Muslim League, a variant spelling.

The party very early demanded and secured separate electorates, which means that the Mohammedans have a number of seats reserved for them in the legislatures and that for these seats they vote in exclusively Mohammedan constituencies. Under the leadership of Mohammed Ali Jinnah, the Moslem League steadily strengthened and, in 1940, it defined as its creed the separation of India into two independent states: Pakistan to comprise the provinces where the Mohammedans predominate, and Hindustan where Hindus are in a majority. At the outbreak of World War II, the league had a membership of less than 600,000, but the 1941 register showed 1,089,881, and 304 of the 603 Mohammedan seats in the legislatures were held by members of the league. After partition the leading supporters of the league migrated to Pakistan.

The orthodox Hindu opinion, vehemently opposed to the demands of the Moslem League, found its expression in the Hindu Mahasabha, the third largest party, founded by V. D. Savarkar. The Mahasabha (meaning "Great Society") pledged itself to organize and consolidate Hindu interests and to achieve the complete independence of the country "as a partner equal with Great Britain in the Indo-British Commonwealth."

Other parties before partition, though with much smaller influence, included the Communist party, the Socialist party, the Radical Democratic party, the Liberals, and leftist Kisansabhas or peasant organizations. The "Untouchables" or "Scheduled Castes" were led by Dr. B. R. Ambedkar. The Sikhs, a reformist Hindu community, with a long martial tradition, retained their important sectional influence.

History. Earliest archaeological evidence of civilization in India comes from the buried cities of Mohenjo Daro and Harappa in the Sind and Punjab provinces of northwestern India. Excavations in these places have laid bare well-built and well-planned cities, and substantial evidence of a highly organized and artistic civilization dating back to 3000 B.C. First literary basis of Indian history, however, comes to us in the hymns, stories, and songs of Aryan tribes who poured into India in waves of pastoral immigration about 1500 B.C. The Aryans spoke the highly developed Indo-Germanic language Sanskrit, but their racial origins are still in dispute, with the balance of present evidence inclining to the view that they were probably ancient Persians, light-skinned, with prominent noses and a high facial angle. Aryan civilization coalesced with or superimposed itself upon the earlier culture, and, about 1000 B.C., the bases of Hindu religion and social organization seem to have been established. This age in India's history is known as the *Epic Period* because our fullest evidence of life and conditions in this period come from the two great Sanskrit epics (about 800 B.C.) the "Ramayana" and the "Mahabharata."

INDIAN TYPES

INDUSTRIALIZATION OF INDIA

Important industries, such as the steel plant shown below, receive government encouragement as India seeks to launch an era of industrial expansion. The home industries, employing 6,000,000 artisans and still the backbone of the nation, will eventually be integrated with the country's large scale production (*Picture courtesy Government of India Information Service*)

VILLAGE SCHOOL

Handicrafts are a part of the curriculum in Indian education

India of the Epic Age appears to have been organized into numerous states, most of them monarchies but some republics, with the lowest administrative unit being the largely autonomous and self-sufficient *grama*, or village, administered by village councils of elders, called *Panchayats*. The Epic Period closes with the rise of Gautama Buddha, about 500 B.C. Although Buddha's influence on Hindu society of the time was profound, the religion which he founded has flourished only abroad, with less than 1,000,000 of the present population of India being Buddhists. His teachings were applied as a steady policy in 250 B.C. by the greatest monarch in Indian history, Emperor Asoka, who organized practically all India into a peaceful and progressive kingdom. In 518 B.C. a Persian army of Emperor Darius invaded India, but the most serious invasion of this age was in 327 B.C. by Alexander the Great of Macedon, who penetrated up to the banks of the Indus.

Hindu India flourished under various kings and emperors up to about the 8th century A.D., this period marking the beginning of aggressive incursions and raids by Mohammedan adventurers from across the northwest frontier. This troubled period of continuous Mohammedan invasions and brief sovereignties was ended by Babur, who was descended from both Genghis Khan and Tamerlane, the two most famous Asiatic conquerors of the age. Babur established an empire over Northern India in the early 16th century. His Mogul empire continued in full strength, controlling most of Northern India and varying portions of Peninsular India up to 1706. The greatest sovereign of the line was Akbar (1542-1605), whose reign was one of religious tolerance and of beneficent administration. He was succeeded by Jehangir and then by Shahjahan, and the latter is remembered as the builder of the magnificent mausoleum the Taj Mahal. Shahjahan was followed by the fanatic Aurungzebe, a bigoted ruler who launched on a career of savage intolerance which led finally to the undoing of the Mogul empire.

European traders and seafarers had long been interested in India and her products, and it was about the time of the disintegration of the Mogul empire that they established trading posts in coastal villages. First of these were the Portuguese who established fortresses and trading centers on the Malabar Coast but who were never able to extend their influence. The Dutch established a foothold in India in 1595, but their main interest was farther east, in Java and Sumatra. In 1613, the British East India Co., which was chartered by Queen Elizabeth in 1600, founded a settlement in Surat and later obtained territory at Madras and Calcutta. At about the same time, the French founded their settlements on the east coast of India, and the European wars between Britain and France were reflected in hostilities between the two countries on Indian territory. A period of intense rivalry was finally decided in Britain's favor when, in 1757, Clive won Bengal by a victory over the Mogul viceroy at the Battle of Plassey. Thereafter, the East India Co. took advantage of the anarchy which resulted from the complete disintegration of Mogul power and extended its territory. By 1850, the Company, still functioning under a trading charter, though increasingly supervised and controlled by the British government, had established virtual control of all India. This, however, did not mean that the whole country had been conquered, and various Indian chieftains and princes had managed to retain their ruling powers in larger or smaller states covering about two-fifths of the area. Owing to a variety of causes and inspired by several motives, a great mutiny broke out in 1857. In the year after the mutiny, the British government formally abolished the East India Co. and assumed jurisdiction in its own name, and, in 1877, Queen Victoria was proclaimed Empress of India.

Indian states which had not by that time been conquered or annexed were guaranteed their internal sovereignty subject to earlier treaties, the obligations of which were now assumed by the Crown. Wars with Afghanistan and Burma occurred in 1878 and in 1884, and the latter country was annexed in 1886. Burma was administered as a province of India until 1935, when it was separated. The boundary between India and Afghanistan was surveyed and determined by the Durand Treaty of 1893.

After 1857 a series of Acts of Parliament was passed in order to provide a steady development of the constitutional position. The important landmarks are as follows: Establishment of legislative councils (1861), of municipalities and district boards (1883), inclusion of elected Indian ministers in the legislative councils (1892), and further enlargement of the legislative councils and the provision for a majority of elected Indian members in all of them (1909). In 1917 the policy of the British government toward India was defined as that of "the increasing association of Indians in every branch of the administration and the gradual development of self-governing institutions with a view to the progressive realization of responsible government in India as an integral part of the British Empire." Implementing this declaration, an act was passed in 1919 which enlarged the legislative councils in all the provinces and also provided for a central legislature of two houses at Delhi, the legislative assembly, and the council of state. According to the act, provincial government was divided into two spheres, and control of one of these spheres was given to elected Indian ministers chosen by the majority in the provincial legislatures. The following years were a period of storm in Indian politics, however. Hindu and Moslem leaders had rejected the proposed steps toward self-government, and Gandhi's passive resistance movement had flared into rebellion in several instances. Constitutions in the central provinces broke down completely, and autocratic government had to be restored. Lord Reading, who had become viceroy of India in 1921, succeeded in establishing some kind of self-government in most of the local provinces before giving up his post in 1926. In 1929 a further stage was reached by the declaration of the viceroy, Lord Irwin (later Earl of Halifax), that " it was implicit in the Declaration of 1917 that the natural issue of India's constitutional progress is the attainment of dominion status." This was followed by the Round Table Conference in London between British and Indian leaders in 1930-31 and the enactment of the Government of India Act in 1935.

This act broadly provided for provincial autonomy at the provinces and for a federation at the center. British governors of provinces continued in office but their powers were confined to emergency powers. As regards the central government, the act provided for a two-house federal legislature composed of the representatives not only of British India but of the Indian States as well.

While the part of the act which conceded control of the provincial governments to elected Indian representatives (known as provincial autonomy) was generally accepted, the federal part was bitterly contested. The act was implemented in 1937, but only as regards provincial autonomy. Elections were conducted in all the provinces, and the leaders of the majority parties assumed government of the provinces.

This was the position reached by the outbreak of war in September 1939. The provincial governments were functioning well under elected Indian ministers, but the central government continued on the 1919 model. There were two houses of legislature in Delhi, and this legislature had a wide range of powers of legislation and criticism, but the executive powers were vested in the viceroy of India and his executive council, composed of British and Indian members appointed by and responsible to the viceroy.

World War II brought new stresses for British rule and intensified divisions in Indian opinion. The British raised a volunteer Indian army of 2,000,000 men; they played a conspicuous part in the North African and Italian campaigns, in Ethiopia and the Middle East, and against Japan in Assam and Burma. Nonetheless, some Indian extremists fought on the side of the Japanese, and the war produced no truce in the political struggle for independence. The Congress party, led by Gandhi and Jawaharlal Nehru, was the main instrument for the demands for freedom. However, the desire for partition of the subcontinent and the creation of a separate Moslem state, Pakistan (*q.v.*), expressed by the Moslem League under the leadership of Mohammed Ali Jinnah, complicated the issue. With British fortunes in Asia and elsewhere at a low ebb, London sent Sir Stafford Cripps to India in 1942 in a plea for wartime cooperation. He offered the establishment of a self-governing Indian union as soon as the conflict ended, with each state or province having the right to abstain from participation. The Congress party spurned the offer, demanding immediate independence and sanctioning a mass civil-disobedience campaign. The British arrested Gandhi, Nehru, and other party leaders; Gandhi was released because of ill health in 1944, and the others were freed in June 1945 as new attempts at solution were pressed.

A series of negotiations was conducted (1945-46) under the viceroy, Lord Wavell, and a new British cabinet mission, including Cripps, visited the subcontinent. While progress was made on

a number of issues, the stumbling block was the quest of the Congress party for a united India against the Moslem demand for a separate Pakistan based on the "two nation theory." Communal violence between Hindus and Moslems erupted in a number of places, making the situation urgent. British Prime Minister Clement Attlee announced on Feb. 20, 1947, that Britain would quit India by June 1948 in any event. Viscount Louis Mountbatten was appointed to serve as the "last viceroy" and to implement the decision. Mountbatten immediately went to the subcontinent, conducting innumerable conferences with Indian leaders which finally led to the decision in June 1947 to partition the vast territory. The British Parliament passed the Indian Independence Act in July, and two dominions, India and Pakistan, came into being on Aug. 15, 1947; each was free to change its form of government and sever its tie with the Commonwealth at a future date. See also *British Commonwealth of Nations.*

Partition constituted a major upheaval for the subcontinent. It included dividing all the assets of the previous state, from filing cabinets to pencils, splitting the civil service and the armed forces. Even the insane and prisoners were exchanged. Pakistan, with a population of about 70,000,000, constituted an area of 361,000 sq. m., including Baluchistan, Sind, West Punjab and the Northwest Frontier in the west and—in the east, across 1,000 miles of Indian territory—East Bengal and the district of Sylhet. India embraced 1,220,000 sq. m. and about 339,000,000 persons. The territorial division was made in some cases by provincial legislative decisions, in others by referenda or boundary commissions. The 562 princely states of India, which Great Britain had controlled through treaties with their rulers, were cast loose to accede to one or the other of the dominions or to attempt to remain independent. Almost all quickly joined either India or Pakistan, the notable exceptions being Kashmir and Hyderabad. The partition arrangements could not put all Moslems on the Pakistan side of the border or all Hindus on the Indian side, and the whole process was seriously jeopardized by renewals of communal strife, particularly in the Punjab. The violence and plunder set off a spontaneous wave of migration, creating a major refugee problem for both states. About 5,000,000 Hindus and Sikhs left Pakistan and crossed into India, while an estimated 6,000,000 Mohammedans departed from India. Gandhi, who had finally seen his dream come true, devoted his efforts toward ending the civil strife; but he was assassinated by a Hindu extremist in January 1948.

Settling the future of both Kashmir and Hyderabad involved India in international difficulties. The Nizam of Hyderabad, ruler of 18,000,000 people in the largest of the princely states, decided to hold out for independence, but he was confronted with an Indian ultimatum in August 1948. In September the Indian army, contending that force was needed to quell internal disturbances, took over the state after a five-day battle. Pakistan placed the question before the U.N., but the international organization failed to agree on a course of action.

Sir Hari Singh, Hindu maharajah of the state of Jammu and Kashmir, also sought to maintain the independence of his predominantly Moslem territory, but he acceded to India when his domain was invaded by tribesmen from Pakistan in 1947. India promptly sent troops into Kashmir, and Pakistan's regular forces also moved in, leading to full-scale fighting. The dispute was taken before the U.N. early in 1948, and by the end of the year a cease-fire had been negotiated. Both nations agreed to settle the future of the state by a plebiscite; however, the conditions under which the voting was to be held remained the subject of a prolonged diplomatic stalemate.

The achievement of dominion status in 1947 was the prelude to some comprehensive constitutional changes in the Indian state. The first government consisted of a cabinet headed by Prime Minister Nehru and responsible to a constituent assembly charged with the task of drafting a new constitution. Like other dominions, India was technically a monarchy, with the British crown as its titular head and with a governor general appointed to represent the crown. The desire of Indian leaders to convert their country into a republic—thus making national independence clear-cut—without necessarily dropping membership in the British Commonwealth, resulted in a new legal formula adopted by a Commonwealth prime ministers' conference in April 1949. Under this arrangement, India, as a republic, was permitted to remain a full member of the Commonwealth by accepting the British monarch as "the symbol of the free association of its independent member nations and, as such, the head of the Commonwealth." Thus, the new Indian constitution, put into effect on Jan. 26, 1950, established the nation as a sovereign democratic republic.

A president, Rajendra Prasad, replaced the governor general as formal chief of state. In accordance with the parliamentary system, however, the prime minister continued to be the country's effective political leader, forming a cabinet responsible to the new two-chamber legislature, comprising the House of the People and the Council of States. A federal union, India consisted of 28 states upon the adoption of the constitution, and a 29th, Andhra, was added in 1953 when the northern half of Madras was

formed into a new unit on a linguistic basis. The constitution established Hindi in Devanagri script as the nation's official language; it further provided that English would also be used officially for 15 years. A lengthy document of 254 pages, the Indian constitution included statements of government policy and broad directives, as well as basic laws.

Independent India's first national elections were held from October 1951 to February 1952, with all men and women over 21 eligible to vote. About 107,000,000 persons cast their ballots. The Congress party, which had led India to independence, remained dominant, gaining a plurality of 45 per cent of the vote. Because its opposition was scattered and fragmentized, the party scored heavily in the number of successful candidates, putting into office 362 of the 489 elected members of the House of the People. The Congress party also won two-thirds of all seats in the legislative assemblies of the separate states. Communist candidates, although they polled only 5.4 per cent of the total vote, won 23 seats in the federal lower chamber, to become the second largest party bloc. Communist strength in some of the states, including Travancore-Cochin, Madras, and West Bengal, was significant and gave the party pivotal positions in these state legislatures. Two other opposition parties, the Socialists and the Peasants' and Workers' People's party (KMPP), each outpolled the Communists but elected fewer candidates; after the election these two groups merged to form the Praja (People's) Socialist party. Several Hindu religious groups and a number of independents also played a part in the Indian political alignment.

The election gave Prime Minister Nehru a renewed mandate for the widening political, social, and economic revolution which had seized India since independence. Among the notable reforms was the abolition of the princely state system, with the New Delhi government compensating the hereditary rulers for the loss of their power and financial privileges by paying them lifetime pensions. The new constitution outlawed untouchability, striking a major blow at India's ancient caste system. Increasing attention was given to women's rights, education, health, and many other aspects of daily life.

The government's main task was an attack on India's widespread poverty. Drought conditions in 1951 led India to seek a $190,000,000 wheat loan from the U.S.; in later years food supplies improved sufficiently for grain imports to be reduced. The nation's need for greater agricultural yields and increased industrialization caused the government to outline a five-year plan calling for capital expenditures of $4,200,000,000 by 1956. Under this program 1,420,000 acres of new land were put under irrigation and hydroelectric

GANDHI AMONG HIS FOLLOWERS

power was increased by 315,000 kilowatts by 1954. Cotton, jute, and sugar output was boosted, and work was begun on still greater river valley development programs.

From independence onward, India played a prominent role in international affairs. Although Prime Minister Nehru, who acted as his own foreign minister, frequently expressed a preference for fewer world responsibilities, India's size and its position in Asia led to continued diplomatic activity. Tension with Pakistan was an almost constant factor in Indian foreign relations; friction arose not only over Kashmir but also over water rights, trade, and treatment of minorities. India was one of the first countries to recognize the Communist government in China after its acquisition of power in 1949. When the Korean war broke out in 1950, India joined in diplomatic censure of North Korean Communist aggression and sent a medical unit to serve under the U.N. command. Nonetheless, India remained in closer diplomatic contact with Communist China than most non-Communist nations, and New Delhi served as a leading participant in the negotiation of a Korean armistice in 1953. Indian forces acted as neutral custodians of disputed groups of prisoners of war while their future was determined (see also *Korea*).

An advocate of Red China's admission to the U.N., Prime Minister Nehru was frequently accused by Americans of "neutralism" and "appeasement." The Indian leader contended that he favored a policy of "noninvolvement" for his country, seeking to avoid membership in military blocs. Indian-American relations became somewhat strained because the U.S. agreed to extend military aid to Pakistan. India's anticolonialism and its tendency to minimize the military threat posed by international Communism contributed to a number of other frictions with Washington. Indian views, however, were influential in some Commonwealth countries, in-

INDIA'S FIRST PRESIDENT

As India becomes a republic, Jan. 26, 1950, Dr. Rajendra Prasad (*center*) is sworn in as its first president. Seated at the right is Shri Chakravarti Rajagopalachari, who, under the Union of India, had served as India's first native governor general

VISITING STATESMAN

Prime Minister Jawaharlal Nehru (*left*), of India, is greeted during a visit to Paris (1962) by French Premier Georges Pompidou

Wide World Photo

cluding Great Britain and Canada, adding to their impact on Western diplomacy.

India Ink or CHINA INK, a black ink used in drawing. It consists of a suspension of lampblack (*q.v.*) in water, with gum and glue. It is prepared in the form of cakes, consisting of the lampblack and glue. The liquid ink is prepared by crumbling the solid cake in water and adding gum to it to prevent the lampblack from settling on the bottom.

An ink of this type was known in China as early as the 3rd century B.C. and is still used in the East for writing. India ink is an intensely black and permanent ink and is extensively used in drawings, such as line drawings.

Indiana (*ĭn-dĭ-ăn′ą*), a state in the East North Central section of the U.S., the nation's third-largest producer of steel, and one of the leaders

in manufacturing in general. Well known as one of the states of the Corn Belt, Indiana actually produces a greater value of manufactured goods than agricultural products. It is a state of level plains, rolling woodland, and quiet-flowing, tree-shaded streams. It is located, as the state motto suggests, at the crossroads of America.

Indiana is bounded on the N. by Lake Michigan and Michigan, on the E. by Michigan and Ohio, on the S. by the Ohio River, which separates it from Kentucky, and on the W. by Illinois. It ranks 38th in size among the states and 11th among the states in population, according to the 1960 Decennial Census of Population (the District of Columbia included in both rankings). The state's name means "home of the Indians." The nickname "Hoosier State" is thought by some to have originated from a greeting call of the pioneers, "Who's hyer" (Who's here?). Another theory, perhaps more historically sound, suggests that in the dialect of Cumberland (England), home of many of the settlers in the Southern mountains, some of whom moved north and west into Indiana, the word *hoozer*

Location	Between 84°49′ and 88°2′ W. long. and 37°47′ and 41°46′ N. lat.
Area	36,291 sq. m.
Land	36,185 sq. m.
Inland water	106 sq. m.[1]
Extent: North to south	ca. 260 m.
East to west	ca. 150 m.
Population (1960)	4,662,498
Capital city	Indianapolis
Highest point	Randolph County (1,240 ft.)
Lowest point	Ohio River (320 ft.)
Admitted to the Union (19th state)	1816
Song	"On the Banks of the Wabash," words and music by Paul Dresser
Flower	Peony
Bird	Cardinal
Motto	"The Crossroads of America"
Flag	See color plate in Vol. X!

[1] Including part of Lake Michigan, the water area is 314 sq. m., bringing the total area to 36,519 sq. m.

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GEOGRAPHY

Indiana may be divided into three regions: northern Indiana, or the lake region, bordering Lake Michigan; central Indiana; and southern Indiana, which is part of the valley of the Ohio River. Almost all of Indiana, except a small area in the south central part of the state, was scraped flat thousands of years ago by the great glacier that once covered much of North America. In places, the glacier scratched hollows in the plain which filled with water as the glacier retreated. These became the many lakes of northern Indiana. Best-known of these are the Wawasee, Maxinkuckee, Tippecanoe, Bass, and James

lakes. In other places, the glacier pushed before it piles of earth and boulders. When the glacier withdrew, these ridges of soil and rock, called moraines, were left behind to form the many low hills of northern Indiana. The northwestern corner of Indiana touches Lake Michigan. This section of the state is highly industrialized, the chief city being Gary, a center of steelmaking.

Central Indiana varies from an almost-level to a gently rolling plain. A small highland area in east central Indiana rises a few hundred feet above the rest of the state. A point in Randolph County in this section has an elevation of 1,240 ft., the highest in the state. Elevations in the rest of Indiana run from *ca.* 300 ft. to 1,000 ft., being higher in the lake region than in most of the center or south.

South central Indiana has a limestone base, and, as water action eats away at the stone underfoot, many caves are formed, of which Wyandotte Cave is probably the best known. Sometimes the roof of a cave collapses, opening a hole to the surface. Such openings, called sinkholes, are common in southern Indiana. Other interesting sights in Indiana are the burial places of the prehistoric Indians called Mound Builders. Near Anderson and Newburg are such cemeteries, with a number of impressive mounds of

different sizes. In western Indiana, where the soil is underlaid by a soft sandstone, Sugar Creek, a tributary of the Wabash, has cut a deep gorge through the rock.

The land forms of southern Indiana are somewhat more varied. Here the plain is cut by numerous river valleys, and here, in the area untouched by the glacier, are striking wooded hills. The lowest region of the state, in the southwest corner, occurs where the Wabash River joins the Ohio. Farther upstream, the Ohio runs at times between high bluffs that afford impressive views.

The soil of the northern region is composed of a particularly rich, black muck left behind by the draining of marshes. This soil lends itself to dairying, truck farming, and to two highly specialized crops, peppermint and spearmint, of whose flavorful oils Indiana supplies *ca.* 75 per cent of the nation's total production. Central Indiana, a part of the productive Corn Belt of the Midwestern states, has also become one of the leading tomato-producing regions. The varied soil and land-form conditions of southern Indiana encourage a wide variety of crops, including fruits and tobacco.

Indiana's largest river is the Ohio, which forms the entire southern border with Kentucky and has carried great volumes of traffic since the days of earliest settlement. The Wabash, a tributary of the Ohio, rises in north central Indiana and flows southwestward across the state; turning south just below Terre Haute, it forms the border with Illinois until it meets the Ohio. Other important streams are the White and Kankakee rivers.

Many scenic attractions draw visitors to Indiana. Especially notable are the Indiana Dunes—shifting sand hills beside Lake Michigan, bordered with shady hardwood forests—and the high, rolling, wooded hills of south central and southern Indiana.

Other noted features of Indiana include the Indianapolis Speedway, site of the annual 500-m. auto-racing classic; Spring Mill, near Mitchell, a state park containing a colonial village, with a working gristmill and sawmill run by an overshot water wheel; and the grave of Nancy Hanks, Abraham Lincoln's mother, near Lincoln City.

ANNUAL STATE EVENTS

Nancy Hanks Memorial Service	May 30; Lincoln City
Indianapolis 500-m. Automobile Race	May 30; Indianapolis Speedway
Water Sports Carnival	Aug. 5–7; Michigan City
Tomato Festival	August; Elwood
State Fair	August-September; Indianapolis
James Whitcomb Riley Day	Oct. 7; statewide
Indiana Statehood Day	Dec. 11; statewide

SITES OF INDIANA

George Rogers Clark Memorial Temple (*top left*), at Vincennes, is a memorial to the acquisition of the Old Northwest (*Ewing Galloway*). The battle of Tippecanoe (*above*), Nov. 7, 1811, in which the Indians were routed, is vividly depicted here. The Business and Economics Bldg. (*left*), of Indiana Univ., Bloomington, houses two departments of the institution, which also maintains a campus at Indianapolis. Steel plants along a canal (*below*) on Lake Michigan, at Gary, are located between the Great Lakes iron-ore region to the north and the coal supply of the south (*Ewing Galloway*)

Climate: The climate of Indiana is mild in spring and fall, but summers are often quite hot and winters cold. Northern Indiana is cooler on the average than the southern part. Winters in the north are more severe than in the south, with occasional heavy snowfalls and temperatures sometimes reaching below zero. Rainfall, though heavier in the south than in the north, is adequate for farming throughout the state.

Normal temperature, Indianapolis	
January	31.1° F.
July	78.0° F.
Annual mean	54.5° F.
Latest frost, Indianapolis	April 17
Earliest frost, Indianapolis	Oct. 27
Precipitation, Indianapolis	
January	3.04 in.
July	3.25 in.
Annual	39.24 in.
Average growing season, Indianapolis	192 days

Natural Resources

Most of the soil of Indiana is fertile, well watered, and adapted to a wide variety of crops. Drained marshlands in the northern part of the state provide a rich, black muck which provides very high yields of specialized crops such as cabbage, onions, celery, and mint. The hills of southern Indiana are well suited to orchards (apple and peach).

The leading mineral of Indiana is bituminous coal, which is mined by both strip mining and shafts in the southwestern part of the state. Coal deposits underlie *ca.* 6,500 sq. m., and the state's proved coal reserves were estimated in 1956 at 35,000,000,000 tons. This local coal, of which *ca.* 15,000,000 short tons were mined in 1961, supplies coke for the blast furnaces of the Indiana steel industry. In the same year the state ranked eighth in coal production. The state ranks first in production of building limestone. More than 80 per cent of the limestone used in the U.S. building industry comes from quarries in south central Indiana; "Bedford limestone" is noted for its quality and its beauty. Much limestone is also made into cement or used for soil conditioning. Other mineral resources include petroleum, natural gas, tile clays, and gypsum.

Indiana has some 4,103,000 acres of forest lands, of which 121,589 acres are included in several separate areas of the Wayne-Hoosier National Forest, a Federal project covering lands in both Indiana and Ohio. The state has a stand of live sawtimber of *ca.* 11,671,000,000 bd. ft. The principal trees in the area are walnut, oak, hickory, and maple, all of which are especially useful in the state's woodworking and furniture industries.

The state government engages in several conservation activities. Many places of natural beauty have been preserved and developed as parks. Lakes and streams are stocked with game fish such as bass, pickerel, pike, and catfish, and hunting is regulated. Mining is closely supervised to extend the life of the state's natural resources and to protect the lives of the miners.

Indiana's Economy

At the time of the 1960 census, Indiana had an employed population of 1,717,241. Of this number, *ca.* 35 per cent were in manufacturing; 7 per cent in agriculture, forestry, and fisheries; 5 per cent in construction; and 0.5 per cent in mining. The remainder were employed in the wholesale and retail trades, in government, and in supplying various personal, professional, and other services.

The most important manufacturing activity in Indiana is steel processing, which is centered in the Lake Michigan area around Gary. Other major manufactures are transportation equipment, including motor vehicles and aircraft; electrical machinery; processed foods; and nonelectrical machinery, including industrial, metalworking, and agricultural machinery. The state's value added by manufacture was $6,331,846,000 in 1961.

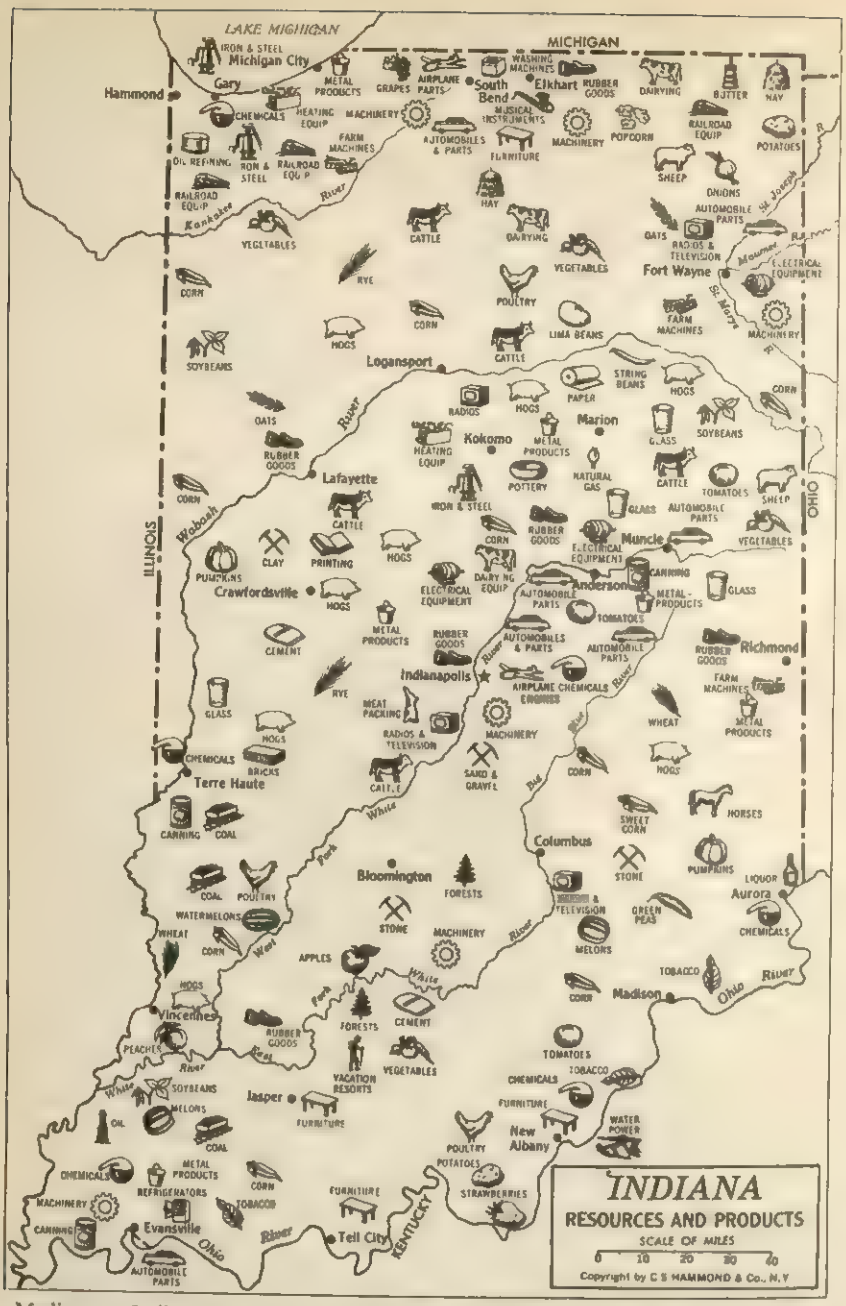
There were 128,160 farms in 1959, occupying a total of 18,613,000 acres. The average farm had 145 acres, with land and buildings valued at $38,489. Indiana is one of the leading hog-producing states in the nation, and about one-quarter of farm marketing income is derived from this source. Other important sources of livestock income include sales of cattle and calves, milk, eggs, broilers, and turkeys. About 60 per cent or more of total farm marketing receipts are normally derived from livestock and livestock products.

Soybeans and corn (the latter is used for hog feed) are the leading crops. Wheat and tomatoes are also important crops, as well as tobacco, oats, hay, potatoes, popcorn, mint, fruits, and melons. In 1961 farm marketing receipts amounted to a total of $1,191,990,000.

Indiana's mineral output was valued at $197,965,000 in 1961, comprising 1.09 per cent of the total U.S. value and placing the state 22nd among the states. The principal minerals, in order of production value, were coal, cement, petroleum, and stone.

Transportation and Communication

Its short Lake Michigan coast gives Indiana water-borne commerce by way of the Great Lakes and the St. Lawrence Seaway. The Ohio River, on its southern border, provides transport to the Pittsburgh area and to the Mississippi Valley waterways. The Wabash River is navigable for *ca.* 200 m., from its mouth to Lafayette. The first railroad to operate in the state



was the Madison & Indianapolis R.R. in 1839, now part of the Pennsylvania R.R. Other principal railroads are the Baltimore & Ohio R.R., the New York Central R.R., the Nickel Plate Road, the Monon R.R., and the Wabash R.R. Railroads totaled 6,593 m. in 1960. In the same year, there were 102,185 m. of rural and municipal roads, of which 7,978 m. were nonsurfaced. All the principal cities have airfields. In 1961 the state had a total of 95 radio and 16 television stations. The first newspaper published in the state was the *Indiana Gazette*, issued at Vincennes in 1804. Among today's leading newspapers are the *Star*, the *News*, and the *Times*, all of Indianapolis.

Population

Indiana has 92 counties. The state's 1960 census population was 4,662,498 (1962 est. population, 4,715,000), an increase of 19.6 per cent since 1950. The urban population comprised 2,910,000, or 62.4 per cent; the rural population was 1,266,686, or 37.6 per cent. Between 1950 and 1960, the urban population rose 23.5 per cent; the rural population rose 11.1 per cent. Approximately 64 per cent of the 1960 urban population lived in the urbanized areas of Chicago-Northwestern

Indiana, Evansville, Ft. Wayne, Indianapolis, Muncie, South Bend, and Terre Haute. Of the total 1960 population, white persons numbered 4,388,554; of the 273,944 nonwhites, 269,275 were Negroes, and the remaining 4,669 included Indians, Japanese, Chinese, Filipinos, and others. Indiana's native-born residents totaled 4,569,249; the foreign-born, 93,202. The population density in 1960 averaged 128.9 per sq. m.

The major religious bodies are the American Baptist Convention; the Christian Churches, International Convention (Disciples of Christ); the Evangelical United Brethren Church; the Lutheran Church—Missouri Synod; The Methodist Church; the Roman Catholic Church; and The United Presbyterian Church in the U.S.A.

Chief Cities: Indianapolis, in central Indiana, is the state capital and the state's largest city, a major manufacturing and distribution center.

Gary, on Lake Michigan in northwestern Indiana, the second-largest city, is one of the leading steel centers in the U.S.

Ft. Wayne, in northeastern Indiana, the third-largest city, is noted for the manufacture of machinery.

South Bend, in north central Indiana, the fifth-largest city, produces automobiles, aircraft parts, machinery, and metal goods. It is the seat of the Univ. of Notre Dame.

Famous Men and Women: Ade, George (1866-1944), author and humorist ("Fables in Slang").

Bolton, Sara T. (1814-93), poet and a leader in the struggle for women's rights.

Clark, George Rogers (1752-1818), Virginia-born army officer who won the Northwest Territory for the U.S. during the Revolutionary War by capturing frontier forts at Vincennes and Kaskaskia.

Dreiser, Theodore (1871-1945), novelist, author of "Sister Carrie," "An American Tragedy," and other naturalistic novels.

Dresser, Paul (1857-1911), brother of Theodore Dreiser, popular-song writer, best known for "On the Banks of the Wabash."

Harrison, William Henry (1773-1841), ninth President of the U.S. While first territorial governor of Indiana (1801-12), he defeated an Indian army in the battle of Tippecanoe (1811).

Marshall, Thomas R. (1854-1925), 28th Vice President of the U.S. (1913-21).

Oliver, James (1823-1908), inventor of a steel plow which played an important part in developing the prairie states.

Porter, Cole (1893-), popular-song writer and musical-comedy composer.

Riley, James Whitcomb (1853-1916), poet, author of "The Old Swimmin' Hole," "Little Orphan Annie," many other popular poems.

Studebaker, Clement (1831-1901), founder of a famous wagon factory, later an automobile firm.

Tarkington, Booth (1869-1946), novelist, best known for "Penrod" and "Seventeen," sympathetic pictures of Midwestern boyhood and adolescence.

Urey, Harold C. (1893-), chemist, winner of a 1934 Nobel Prize for discovery of heavy hydrogen.

Education

Education is free and compulsory for children between seven and 16. The state's public-school system was founded in 1852 but was challenged by the courts in 1853 and not re-established until 1867. Public-school enrollment in 1962 totaled 1,028,988, and there were an additional 125,088 in Roman Catholic parochial schools. The leading state-supported institutions of higher learning include Indiana Univ., Bloomington, with branches in other cities; Purdue Univ., Lafayette; and teachers colleges at Muncie and Terre Haute. Private institutions include the Univ. of Notre Dame, South Bend; Butler Univ., Indianapolis; De Pauw Univ., Greencastle; Earlham Coll., Richmond; and Valparaiso Univ., Valparaiso.

Cultural institutions include the John Herron Art Inst., with an art school; and the State Library and the State Historical Society, containing valuable historical materials, in Indianapolis, which is also the home of the Indianapolis Symphony Orchestra. The Nancy Hanks Lincoln Memorial and Lincoln State Park, near Lincoln City, including the Lincoln farm and the graves of his mother and sister, preserve the memory of Lincoln's early life in Indiana. Spring Mill Village, near Mitchell, is a restoration of a colonial village and gristmill. South Bend has the Studebaker Museum of Transportation. Fort Wayne has a Lincoln Museum, the Swinney Homestead, now the county historical museum. At Richmond is located the headquarters of the Five Years Meeting of the Society of Friends, this city having been one of the first Midwest Quaker settlements.

Government

Indiana is governed under provisions of the constitution of 1851. Executive power is given to a governor, lieutenant governor, and attorney general, each elected for four years, and to a secretary of state, auditor, treasurer, and superintendent of schools, each elected for two-year terms. The legislature consists of a senate of 50 members, serving four-year terms on a staggered basis, and a house of representatives of 100 members, serving two-year terms. The legislature convenes regularly on Thursday after the first Monday in January of odd-numbered years for a session limited to 61 calendar days. The state supreme court has five justices serving

terms of six years each. There is also an appellate court of six judges serving four-year terms. Other courts include 82 circuit courts, several superior courts, and probate, municipal, juvenile, and criminal courts. Indiana is represented in the U.S. Congress by two Senators and 11 Representatives.

History

The French, making efficient use of natural waterways, were the first white men to explore Indiana. René Robert Cavelier, Sieur de La Salle, on his first expedition (1669-71), of which little is known, probably made his way through Inidana to the Ohio River. In 1679 he crossed the northwestern corner of the present state of Indiana, following the St. Joseph and Kankakee rivers. The French later established fur-trading posts at Vincennes and the present Ft. Wayne, part of a chain of forts by which the French held their American colonies. New France, however, fell to England in 1763 as a result of the French and Indian War.

When the Revolutionary War broke out, the British occupied the old French forts, making their key base the town of Vincennes. From these bases, they roused the Indians to attack the American settlements on the frontier. Partly to end these attacks, and partly to give the new republic a chance to grow to the west, one of the most daring campaigns of the Revolution was fought. Leaving the East with a mere handful of men, George Rogers Clark, acting on the authority of Gov. Patrick Henry of Virginia, surprised the British and seized Vincennes in 1778, lost it, and recaptured it in 1779. Because of this courageous blow, struck in the dead of winter hundreds of miles from home and against most desperate odds, the whole region from the Appalachian Mts. to the Mississippi River became U.S. territory at the close of the war.

Fighting between settlers and Indians continued after the war. Another Revolutionary hero, Gen. "Mad Anthony" Wayne, defeated the Miami Indians at the battle of Fallen Timbers in 1794. A later Indian war ended when Gen. William Henry Harrison defeated an Indian force under the leadership of Tenskwatawa ("the Prophet"), brother of Tecumseh, in the battle of Tippecanoe (1811). Harrison also defeated a force of British and Indians at the battle of the Thames (1813), where Tecumseh was killed. Indiana was organized as a territory in 1800 and was admitted to the Union as the 19th state on Dec. 11, 1816.

Among the frontier families which helped to build the new state was that of Thomas and Nancy Hanks Lincoln, who moved to Spencer County from Kentucky in 1816; their son, Abraham Lincoln, lived in Indiana until he in turn moved to Illinois at the age of 21. Another interesting group of early Indiana settlers was the population of the model community of New Harmony, founded in 1825 by Robert Owen, an idealistic English factory owner. Although this Utopian-Socialist colony failed, it earned a place in the history of labor and social reform.

The Civil War touched Indiana briefly when Morgan's Raiders, a Confederate cavalry unit, crossed the Ohio River from Kentucky in 1863 and fought one battle on Indiana soil before passing on to Ohio. The state supplied more than 200,000 soldiers to the Union cause during the war.

Indiana has played a considerable part in putting America on wheels. The Studebaker brothers, Clement and Henry, who had learned in Pennsylvania the building of the sturdy Conestoga wagons, moved to Indiana in 1852 and became leading manufacturers of wagons for half a century before turning to automobiles and trucks. Another automotive pioneer was Elwood Haynes, of Kokomo, who, in 1894, invented one of the earliest automobiles. The famous Indianapolis automobile races, which have led to improvements

MAJOR RECREATIONAL AND HISTORIC FEATURES

Name and Type	Size and Location	Points of Interest
Brown County State Park (established 1929)	15,332 acres in south central Indiana, near Nashville (state 46, 135)	Wooded hills famed for autumn coloring; drives and trails; wildlife exhibits
Indiana Dunes State Park (established 1925)	2,182 acres on Lake Michigan, near Gary (U.S. 12; state 49)	Fixed and moving dunes; woodland and lakeside scenery; bathing, camping
Lincoln State Park (established 1932)	1,540 acres in southern Indiana, near Lincoln City (state 162)	Land on which Abraham Lincoln lived as a boy; trails, swimming, boating, fishing
McCormick's Creek State Park (established 1916)	1,225 acres in south central Indiana, near Spencer (state 46)	Limestone canyon of the White River; sinkholes; swimming, foot and bridle paths
Pokagon State Park (established 1925)	956 acres in northeastern Indiana, near Angola (U.S. 27)	Swimming, riding, fishing; winter skiing and tobogganing
Shakamak State Park (established 1929)	1,016 acres in southern Indiana, near Jasonville (state 48)	Coal in its natural state in the park, strip-mining operations nearby; wildlife exhibit; swimming, fishing
Spring Mill State Park (established 1927)	1,210 acres in southern Indiana, near Mitchell (state 60)	Reconstructed early-settlers' village, including gristmill, still, shops, homes; cave; lake
Turkey Run State Park (established 1916)	1,520 acres in west central Indiana, near Marshall (state 47)	Deep canyon cut by Sugar Creek; woodland scenery; fishing, riding

in automotive design, were begun in 1911.

The industrialization of Indiana began about 1875. The native hardwoods lent themselves to furniture making, long a major industry. Natural gas, discovered in the state in 1886, attracted many firms needing inexpensive fuels. In 1906 the U.S. Steel Corp. established its main plant at a new town named Gary on the shore of Lake Michigan; this has since become the largest steelworks in the world. Indiana supplied 133,215 residents to the armed forces in World War I and 403,663 men and women to the forces in World War II. In both wars, Indiana's factories have supplied guns, armor plate, tanks, and aircraft equipment. In peacetime, its farms and factories produce a wide variety of foodstuffs and manufactured goods. The increasing mechanization of American life continues to bring new industries into the state and to expand existing ones, and the opening in 1959 of the St. Lawrence Seaway put the state into direct contact with world trade.

See also separate entries on most of the individuals and geographical and historical subjects mentioned in this article.

Indian Affairs (*in'dĭ-ən ə-fârz'*), BUREAU OF, a Federal agency created in the War Dept. in 1824 and administered since 1849 by the Dept. of the Interior. The bureau acts as trustee for Indian property held in trust by the U.S. and provides education, health, and welfare services when they are not available to Indians from other agencies. The bureau's central office is in Washington, D.C., and it works through a number of area offices and agencies. See *Indians, American.*

Indianapolis (*ĭn-dĭ-ən-ăp'ə-lĭs*), a city and port of entry in central Indiana, the capital and largest city in the state, seat of Marion County, located 110 m. S.E. of Chicago, on the west fork of the White River, a nonnavigable stream. The city is known as the "crossroads of America." It is 71.2 sq. m. in area, including many parks and playgrounds, of which Garfield Park is noted for its sunken gardens and fountains.

DESCRIPTION: Indianapolis is patterned after Washington, D.C. It was laid out in 1821 by Alexander Ralston, allowing for expansion in all directions. Two war memorials are located in downtown Indianapolis—the Soldiers and Sailors Monument, on the Circle, and the World War Memorial Plaza, site of a shrine building and the national headquarters of the American Legion (*q.v.*). The city houses Ft. Benjamin Harrison, home of the Army Finance School. Principal streets are Washington St., running east and west, now part of U.S. 40, and Meridian St., running north and south through the city. The principal business district in the downtown area is located within the original "mile square" of the

Courtesy Ewing Galloway, N. Y.

MONUMENT PLACE, INDIANAPOLIS

city. Residential areas surround the city, and their principal streets and sections are north Meridian and Pennsylvania Sts., Crow's Nest, Woodstock Dr., and Golden Hill. Notable buildings in the city are the Scottish Rite Cathedral, Christ Church Cathedral (Protestant Episcopal), SS. Peter and Paul Cathedral (Roman Catholic), and the J. I. Holcomb Observatory and Planetarium. The state capitol (1888) covers two city blocks in the downtown business section.

Surface transportation includes seven railroad lines, among them being the New York Central, Indianapolis Union, and other railroads. Weir Cook Municipal Airport, an international airport, is located 8 m. from the center of the city.

COMMERCE: Located in a rich agricultural region, with large coal fields to the southwest, Indianapolis is a great grain and livestock center. Local manufactures include pharmaceutical products, motor truck engines, automobile accessories, truck bodies, phonograph records, radios, television sets, road-building machinery, airplane engines, and electronic devices. In 1958 the value added by manufacture for Indianapolis was $729,778,000; for the Indianapolis standard metropolitan statistical area (pop., 1960, 697,567), which includes Marion County, the figure was $955,259,000. The city has been named "boom town of the Middle West."

Each year on May 30, the Indianapolis Motor Speedway (a 2½-m. oval track) is the scene of a 500-m. race, an internationally known sporting event. The city is represented in the American

Assn. baseball league by the Indianapolis Indians. The Indiana State Fairgrounds, covering some 238 acres, are also located in the city. The Fairgrounds Colisseum is the scene of many sports and community events.

EDUCATION: Public-school enrollment comprises *ca.* 55,000 elementary and 17,000 high-school students annually; parochial-school students number *ca.* 20,000. Universities in the city include Butler Univ., Indiana Central Coll., the Indiana Univ. (*q.v.*) schools of medicine, dentistry, and law, Marian Coll., John Herron Art School, Arthur Jordan Coll. of Music, and extension divisions of Indiana and Purdue universities. Here also are the state schools for the deaf and the blind. The public library system maintains almost 20 branch libraries; and there is a special teachers library and a business library. The Indiana state library houses a large collection of material on state history.

The cultural and recreational organizations in the city include the Indianapolis Symphony Orchestra, the Booth Tarkington Civic Theater, and a children's museum. The John Herron Art Inst. houses a notable collection of paintings.

GOVERNMENT: The city operates under an 1847 charter which provides for the offices of a mayor and a nine-member city council, all elected for four-year terms. Boards and department heads are appointed by the mayor.

HISTORY: Indianapolis was settled in 1820 and was made the capital of the state in 1825. It was incorporated as a town in 1832—when the population was 1,683—and incorporated as a city in 1847. The first national encampment of the Grand Army of the Republic (*q.v.*) was held here, in 1866, as was the last, in 1949. The Civil War gave the city its first great impetus to growth in both population and industry. Two World Wars have stimulated its continued growth in the 20th century. Among the well-known residents of the city have been the authors James Whitcomb Riley and Booth Tarkington and the 23rd President of the U.S., Benjamin Harrison.

POPULATION: The city saw a rapid growth between 1860 and 1870—from 18,611 to 48,244—and again between 1890 and 1910—from 105,436 to 233,650. In 1950 the figure rose to 427,173 and in 1960 to 476,258.

Indian Archipelago (*ĭn'dĭ-ən är-kĭ-pĕl'ə-gō*). See *Malay Archipelago.*

Indiana University (*ĭn-dĭ-ăn'ə*), a coeducational state institution of higher learning at Bloomington, Ind. It was founded in 1820 and heads the Indiana public-school system. The university comprises the Coll. of Arts and Sciences, the graduate school, and schools of education, law, medicine, dentistry, business, music, physical education, and nursing. It also has an Indianapolis campus and maintains centers in nine other Indiana cities. The library, which includes several noted collections, has more than 1,000,000 volumes. The annual student enrollment totals *ca.* 23,000, and there are some 2,400 members of the faculty. The physical plant is valued at more than $100,000,000.

Indian Corn (*kôrn*). See *Corn.*

Indian Hemp (*hĕmp*), often called dogbane and many other English names. Known botanically as *Apocynum cannabinum,* in the dogbane family, it is a perennial plant. It has underground rootstocks, from which grow branching stems several feet in height. The leaves are undivided, somewhat oblong, smooth, and grow in pairs. The plant has a whitish, poisonous sap. The small, pinkish or greenish-white flowers appear in clusters near the top of the stems, followed by long narrow pods in pairs. For the eastern American Indians, Indian hemp was an important fiber plant. Today it is a weed found throughout the U.S. and Canada.

Indian Mallow (*măl'ō*), botanically *Abutilon theophrasti,* a member of the mallow family, also called velvet leaf and butter print. It is a tall annual weed, with large, heart-shaped leaves, densely covered with fine velvety hairs. Its flowers, half an inch wide, with five yellow petals, are followed by fruit shaped like inverted cones. When dry, each fruit opens by a series of radiating slits which suggest a small, old-fashioned butter marker. The plant's original home was Asia. It is a weed in almost every state in the U.S. and is hard to eradicate because its seeds may remain alive as long as 50 years.

Indian Music (*mū'zĭk*), American aboriginal music that survives in cultural islands despite four centuries of shrinkage, secularization, or blending with Iberian influences. Indian music almost invariably serves a particular purpose, especially as an accompaniment to ceremonies or in connection with a tribal custom. Traditional rites persevere, although new music may be created to accompany them from time to time. Individual singers may use song in divination, to achieve visions, to narrate, or in contests with other individuals. Male choruses accompany the rituals which are concerned with puberty, the treatment of illness, the harvest, the hunt, and war and peace. North American Woodland dancers answer a leader in antiphonal phrases. Navaho spirit-maskers chant an eerie falsetto. Women may sing meekly at death and maize rites or hum a drone at the clan festivals.

The unharmonized vocal music is accompanied by percussion instruments—wooden, hide, basketry, and pottery drums; notched rasps, striking sticks, and clappers; and rattles of bark, hide, horn, gourds, nutshells, turtle shells, deer hoofs, cocoons, or metal—often worn or manipulated

by dancers. Sistrum-type rattles and string instruments (except musical bows), used by the Indians in relatively modern times, were copied from prototypes brought to the Western Hemisphere from Spain. Native wind instruments include ceremonial whistles, Algonquian courting flutes, Mexican cane flutes and conches, and South American Panpipes and trumpets.

There is a rich diversity in the music of the various regions. Music also varies according to its function and to the individual performer. North Pacific Coast Indians recite melismatically (one syllable to a number of notes) in narrow three-tone scales with complex drum beats; Great Lakes tribes sing full-throated, symmetrical melodies undulating within an octave's compass; Great Plains singers tighten their throats in rhapsodies cascading 12 to 17 tones in wide intervals. Similar contrasts distinguish ancient wizard rites, animal dances, and recent social dance songs. Tempi range from slow tobacco invocations to measured therapeutic songs and frenzied war chants. Melodic structures vary from formlessness to thematic development by sequence, inversion, contraction, and expansion. However, many tribes share a type with a descending melodic trend, tetratonic or pentatonic scale, modified syncopation, vocal pulsation, and regular duple or iambic percussion beat.

Cultural interchange has produced large eclectic repertoires, like that of the Iroquois, and has spread the distinctive songs of the calumet dance, antiphonal stomp, drum religion, ghost dance, and peyote, or hikuli, cult. In addition, such interchange is creating new forms, for example, the Oklahoma Two-step, combining native and European techniques.

Indian Ocean (*ō'shạn*), the third in size of the five great oceans. It lies S. of Asia, W. of the Sunda Isles and Australia, N. of the Antarctic Ocean, and E. of Africa. An indefinite line somewhere between 40° and 50° S. separates it from the Antarctic Ocean. India divides it into the Bay of Bengal and the Arabian Sea, and from the latter the Persian Gulf and the Red Sea branch toward the northwest. Its breadth from the Cape of Good Hope to Tasmania is about 6,000 m. Passing through it is the Equator, along which the equatorial current flows from east to west. Its navigation is influenced by periodic monsoons and trade winds. The principal rivers flowing into it include the Limpopo and Zambezi from Africa; the Ganges, Indus, Brahmaputra, Tigris, Euphrates, and Irrawaddy from Asia; and the Ashburton, Gascoure, and Murchison from Australia. Ceylon and Madagascar are the only large islands, though there are many small islands and several important groups of islets. Its depth is greatest near the coast of Asia, southeast of Java, where soundings to a depth of 24,450 ft. have been made. The average depth of the ocean is *ca.* 13,000 ft., and its area is *ca.* 28,356,000 sq. m.

Indianola (*in-dĭ-ạn-ō'lạ*), county seat of Warren County, Iowa, 16 m. S. of Des Moines, on the Burlington Lines and other railroads. It is surrounded by a fertile agricultural and coal-mining region. It is the seat of Simpson Coll., a Methodist (coeducational) institution founded in 1867. Lake Ahgusbi state park is nearby. Population, 1905, 3,396; in 1940, 4,123; in 1950, 5,145.

Indian Pipe (*pīp*), known botanically as *Monotropa*, a member of the heath family. It is a small, ghostly white, wild flower of the eastern U.S. The plants grow in small clusters a few inches high. Each stalk bears a nodding, bell-shaped flower at the top and small, scale-like leaves along the sides. Since the Indian pipe has no green pigment (chlorophyll), it has to get its food from decaying matter in the soil.

Indian Reservations (*rĕz'ĕr-vā'shŭnz*), tracts of land set apart for the U.S. Indians by treaty or by executive order. Congress and the Federal courts have always recognized Indian title to land occupied or used by Indians before the coming of the white man. To acquire this land for non-Indian use, treaties were usually negotiated with the Indians, providing for the cession of certain lands for a consideration (either in cash or in the promise of educational or health services) and for the guarantee of continued and permanent Indian retention of certain portions of their lands. Occasionally, Indians traded lands in one state or territory for land in another state or territory. In some instances, the more warlike tribes agreed to remain within the reserved lands, and sometimes the government agreed to keep non-Indians out of these lands. By 1924, when all Indians were given citizenship, all restrictions on individual movement had been rescinded, and today there are no restrictions imposed on the Indian as an individual.

Because Indian tribes were first regarded as virtually sovereign nations, their property was not subject to taxation. Subsequently, the right to hold ancestral lands in tax-exempt status was embodied in many treaties and statutes. Today practically all Indian trust lands are exempt from local real estate taxes. However, Indians must pay taxes on all non-trust property and all fees and taxes for the enjoyment of state privileges, such as driving on state highways.

The Navajo, which is the largest Indian tribe, numbers about 70,000 Indians. The tribe occupies an area of over 25,000 sq. m. in northern Arizona and New Mexico and southern Utah, equal in size to the state of West Virginia. There are other large reservations in the Dakotas, and smaller reservations in 20 other states. In Iowa and North Carolina, the land now in reserved status was originally purchased by the Indians

Courtesy U.S. Indian Service

TRIBAL MEETINGS
Indian self-government is encouraged by the U.S.

Courtesy U.S. Indian Service

LAGUNA INDIAN GIRL
Carrying water in a piece of native pottery

themselves, who later asked the Federal government to supervise it for them. Indian reservations currently being administered by the Bureau of Indian Affairs in the Dept. of the Interior comprise a total of about 56,000,000 acres.

About 14,695,000 acres are owned by individuals, and about 40,000,000 acres are jointly owned by tribes, bands, or groups. About 1,000,000 acres available for Indian use are Federally owned. Of the total 56,000,000 acres, 540,000 are irrigated lands, 3,255,000 are dry farm lands, 49,000,000 are classed as grazing and timber lands, and about 3,000,000 are barren and waste lands.

Much Indian reserved land was transferred from tribal to individual ownership as a result of the General Allotment Act of 1887 and other subsequent laws. Through the operation of inheritance over several generations, the ownership of many of these allotments has become minutely fractionated. Under present government policies, an effort is being made to consolidate Indian land holdings in order that Indians may be more self-supporting and in order to compensate for desert or submarginal land which cannot be improved by irrigation or other means. The practice of breaking up reservations formerly held by the tribe as a whole into individual fee-simple holdings has been stopped. In addition, the latest scientific methods have been applied to improving Indian lands. In line with the existing policy of transferring, as soon as feasible, to the Indians themselves, either as groups or individuals, the responsibility for management of their properties, the government emphasizes the development and use of procedures to facilitate the orderly termination of Federal supervision over the trust or restricted lands.

Over the last two decades the Indian population has been increasing rapidly. (In 1950: 421,600 Indians in the U.S.; 14,089 Indians in Alaska.) To facilitate education and safeguard health, schools and hospitals are maintained at many Indian reservations. However, more than half of all Indian children attend local public schools with their non-Indian neighbors, and in line with the general emphasis on termination objectives, the government observes a policy of not operating any health facility for Indians where other similar facilities are available and can be utilized.

Indian River, a long, narrow lagoon on the east coast of Florida, running parallel with the coast in Brevard, Indian River, and St. Lucie counties for about 125 m. The lagoon is sheltered from the Atlantic by a long, low barrier beach built up by the action of waves and currents. Indian River is navigable by small boats of shallow draft and is celebrated as a fishing resort. There are numerous citrus plantations on its mainland shore.

Indians (*in'dĭ-ănz*), AMERICAN, the collective name applied to the people found in America when it was discovered by Columbus. The name originated from the incorrect idea that the continent was a part of India, and that these people were only a portion of the great population of Southern Asia. Speaking about 250 different tongues, some now extinct, the Indians called themselves by a variety of names. More recently they came to be called the *American* or *Red* race.

INDIAN POPULATION. At the time of the discovery of America in 1492, it is generally assumed that the Indian population of both North and South America was fully 12,000,000. In the region later comprising the mid-continental U.S., there were about 720,000 Indians before the discovery. In 1887, the number of Indians in the U.S. had reached the low figure of 242,571. James

Courtesy U.S. Indian Service

WASHOE INDIAN WOMAN
From the Pyramid Lake Reservation

Courtesy Santa Fe Railway

AN INDIAN PUEBLO
The "Sky City" of Acoma, New Mexico

Mooney, writing in 1910, ascribed the decrease to the following factors, in order of importance: (1) smallpox and other epidemics; (2) tuberculosis; (3) venereal diseases; (4) whisky and attendant dissipation; (5) removals; (6) starvation and subjection to unaccustomed conditions; (7) low vitality due to mental depression under misfortune; and (8) wars. In 1904, the Indian population curve for the U.S. began to move upward. By 1941, the margin of Indian births over deaths per 1,000 Indians was 10.6 per cent. The 1960 census recorded *ca.* 524,000 Indians in the U.S., compared with *ca.* 343,000 in 1950 and 334,000 in 1940. Canada in 1951 had an Indian and Eskimo population of 165,607. Every state in the Union has some Indian residents. According to the U.S. Bureau of Indian Affairs, the largest reservation is the Navajo, comprising more than 16,000,000 acres, principally in Arizona. At present there are more than 300 reservations or other Indian land units for which the Federal government has responsibility. East of the Mississippi River there are 14 other reservations or Indian communities under state or local jurisdiction. The Indian population is principally distributed as follows (according to data based on the 1960 census): Alaska, 14,444; Arizona, 83,387; California, 39,014; Colorado, 4,288; Florida, 2,504; Idaho, 5,231; Illinois, 4,704; Iowa, 1,708; Kansas, 5,069; Louisiana, 3,587; Maine, 1,879; Massachusetts, 2,118; Michigan, 9,701; Minnesota, 15,496; Mississippi, 3,119; Montana, 21,181; Nebraska, 5,545; Nevada, 6,681; New Jersey, 1,699; New Mexico, 56,255; New York, 16,491; North Carolina, 38,129; North Dakota, 11,736; Oklahoma, 64,689; Oregon, 8,026; Pennsylvania, 2,122; South Dakota, 25,794; Texas, 5,750; Vermont, 6,961; Virginia, 2,155; Washington, 21,076; Wisconsin, 14,297; Wyoming, 4,020.

Distribution. The distribution of the Indians at an early period depended upon the existence of forests and game or of arable land. All were members of one great race, but they ranged from the rudest savages to the cultivated Aztecs of Mexico, the Mayas of Central America, the Incas of Peru, and the Pueblos of the Southwestern U.S. In the extreme north were the Eskimos, who still occupy the northern part of the British possessions, Alaska, and Greenland. Those formerly dwelling in the vast regions south of the Eskimos have been widely diversified by intermarriage and scattered from the regions they formerly occupied. The tribes occupying the northeastern portion of the U.S. were classed either with the Algonquin or Iroquois families. Those in the northwest, extending far into Canada, were classed as Siouan Indians, while in the southern regions were the Muskhogeans. The Indians of the Northwestern U.S. and of Western Canada included those of the Salishan and Athabaskan stocks, while the Indians of California belonged to many small families. The Aztecs occupied large portions of Mexico and Central America, but in these regions were also the Otomi, Maya, and Quiché Indians. Most of the Mexican tribes other than the Aztecs belonged to the Uto-Aztecan stock, as did many of the tribes in the American Southwest. In Chile

SIOUX FROM MANDAN IN NORTH DAKOTA

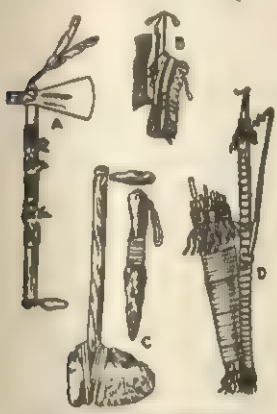
were the Araucanians; on the Atlantic slope, the Guaranis; and on the northern coast, the Caribs, who also occupied many West Indian islands. In the extreme south lived the tall Patagonians. See also separate articles on individual tribes.

Indian Wars. The Algonquin and Iroquois linguistic groups included many tribes, several of which were continually at war with each other for supremacy, and later offered formidable resistance to the onward march of the Europeans. At intervals the Five Nations of the Iroquois made incursions toward the West, where they were met by the warriors of the many affiliated tribes of the Sioux Indians, who were often at war with each other when not in conflict with their more powerful rivals of the East. The English first engaged in hostilities with the Indians in Virginia in 1622, and these were followed by engagements in New England in 1637. The powerful Pennacook Confederacy of northern New England was crushed by the whites in 1675-76, and in the same years the Virginia colonists subdued the Powhatan Confederacy. The Tuscaroras were driven out of North Carolina (1715) and became the Sixth Nation of the Iroquois in New York. The French and Indian War of 1754-60 proved an unsuccessful attempt by France to use Indians for preventing British expansion beyond the Appalachians. Those tribes of the Iroquois who sided with the British in the American Revolution suffered damaging raids from the American Gen. Sullivan in 1779. The Indian wars waged between 1790 and 1795 against the Miami Confederation in Ohio were the most destructive of human life, but Gen. Wayne dealt them a crushing defeat in 1793. The success of Gen. Harrison at Tippecanoe, in 1811, checked them materially, but in the following year the Indians became allied with the British and were again defeated by Harrison in 1813 at the Thames, when Tecumseh was killed. General Jackson in the same year conducted operations against the Creeks in the South and defeated them at Talladega and the Horse Shoe Bend of the Tallapoosa River. He also defeated the Seminoles in Georgia and Alabama in 1817. The Black Hawk War of 1838, in which Abraham Lincoln served, effectively cleared the Indians from the old Northwest Territory. By this time, except for peaceful bands on reservations, Indians had surrendered practically all of the territory east of the Mississippi River. During the 30 years from 1851 to 1880, settlers poured into the West following the discovery of gold in California. The completion of the first transcontinental railroad (1869) split the Plains Indians in half and threatened their meat supply, the buffalo. With the frontier disappearing and all free land taken up by whites, the Indians in this period launched an unavailing series of wars and separate battles against settlers and the Army alike. The last battle of over-all importance with the Indians occurred on the Little Big Horn River, near the Black Hills, in 1876, where Gen. Custer was slain by Sioux warriors. In the Southwest, the fierce Apaches under Geronimo were not subdued by Gen. Crook until 10 years later. In 1890, there was a general rising of the Indians in the Northwest under a "Messiah," and in its course the famous Sitting Bull was slain, and the Sioux were finally rendered harmless. Since then, except for minor outbreaks, the Indians have lived at peace with the whites.

Government and Industries. Government among the Indians was loosely administered. They lived in tribes, bands, or extended family groups, looking for leadership to chiefs or sachems, who in turn usually consulted councils of older men. Among the Pueblos of the Southwest, women were the chief property owners and their voice in public affairs was as influential as that of the men. In general, Indians regarded land as communal property and punished crimes by exile and ostracism as much as by death. The advancement of general welfare was the aim of their code of ethics. Priests among the Aztecs and the Incas wielded great influence on tribal policies. Confederations were formed by Indians for resistance to other tribes or to white intruders, and those of the Creeks and Iroquois were of long duration. Until Sequoyah (*q.v.*), a Cherokee, invented a native alphabet, Indians had no written language and communicated by some 250 spoken tongues, by signs, and by signal fires. Their occupations were principally hunting and fishing. They dwelt largely in tents and other perishable buildings throughout most of the U.S., but some, as the Pueblos, built in stone and adobe, or constructed *kivas*, or public rooms, underground. The Eskimos lived in *igloos* made from sod or blocks of ice. Some tribes developed skill in the culture of corn, beans, and tobacco, and the more highly civilized tribes of Mexico and Peru were considerably advanced in civilized arts. They built dwellings and cities; constructed aqueducts, canals, and highways; had a recognized system of government and a fixed form of worship; and left to future generations massive pyramids and innumerable monuments. The manufactures of the Indians in the region now occupied by the U.S. and southern Canada included bows, arrowheads, pottery, snowshoes, stone pipes, canoes, baskets, and other articles useful to them in domestic life and in the arts of war. Their dress was largely of the skin of animals, and their food consisted of vegetables and a few cereals, but principally of the wild game which was then very abundant. They had few domestic animals aside from the dog, but became very fond of horses, which they first obtained from the Spaniards.

Religion and Characteristics. In religion the Indians held that there is a future life and that the spirit after the death of the body enjoys the happy hunting grounds. It was commonly believed that a spirit animates every living plant and animal. While many of the tribes believed that virtue and bravery constitute essentials to welfare in this life, they did not make a distinction as to the influence that the conduct in the present life might have in attaining to happiness beyond. To Indians, supernatural power was all one, pervading the universe and showing itself now helpful, now harmful, depending on the way it was approached. Human sacrifice was practiced by the Aztecs. Ancestors, memorialized in totem poles, played a large part in the religion of Alaskan and Northwest Coast Indians. Animals and birds figured in the religious mythology of the Indians, and assumed human characteristics. Symbols and dreams were important to the Indians. Religious preparation marked the entrance of a youth into manhood. At death, the body was buried, mummified, cremated, or exposed on platforms. The Indian was a religious dancer of great artistry; rain, sun, and snake dances are still performed by certain American Indian tribes.

The name *Red* race originated from the reddish tint observable in their complexion, which varies from almost white to dark brown. In nearly all Indians the hair is long and straight, usually black, but sometimes brownish. The eyebrows are heavy, the beard is scant, the lips are compressed, and the face is broad. Ethnologists think they descended from the Mongolian race. From the tradition of their tribes it is learned that they themselves thought that they emigrated from some region, but did not know from where. The sun worship of the Incas and Aztecs has been taken to indicate some connection with early Asiatic peoples, while the Eskimos of North America are clearly closely related to those of Siberia.



INDIAN IMPLEMENTS

A Tomahawk; *B* Headdress; *C* Stone Implements; *D* Quiver and Bow Case

Current Indian Affairs. The policy of the government in Canada and the U.S. for many years has been to make citizens of the Indians by giving them every possible encouragement in educational facilities, landed possessions, and financial support.

In 1887, the U.S. passed the General Allotment Act with the purpose of breaking up tribal holdings into individual allotments, thus absorbing Indians into the general population. Between 1887 and 1933, the Indian policy of the U.S. followed the historic line of destroying Indian cultural, social, and economic life; in these years Indian landholdings dropped from 137,000,000 acres to 52,500,000 acres. But under the administration of President F. D. Roosevelt, Indian landholdings between March 1933 and December 1944 increased by more than 4,000,000 acres. Improvement of land is still the basic Indian problem, but today educated Indians are entering the professions, government service, and business.

An Act of June 2, 1924 (43 Stat. 253) declared all non-citizen Indians born within the territorial limits of the United States to be citizens of the United States and provided that such citizenship would not in any manner impair or affect the right of such Indians to tribal or other property. Prior to 1924, many Indians had acquired citizenship by way of Federal statutes and treaties with the U.S.

The majority of American Indians are under the supervision of the Office of Indian Affairs of the U.S. Dept. of the Interior, which works closely with the U.S. Public Health Service, the Dept. of Agriculture, and other government bureaus.

The principal functions of the Bureau of Indian Affairs are to serve as trustee for about 56,000,000 acres of Indian land and for approximately $100,000,000 of Indian money derived chiefly from the leasing or sale of Indian properties; to promote the protection and effective use of Indian resources through programs of credit, agricultural extension and home demonstration, soil and moisture conservation, forest and range management, irrigation, and road maintenance; and to provide the Indian people with community services in the fields of education, health, welfare, law enforcement, and relocation assistance wherever these services are not available to the Indians from other sources.

The primary objective of the Bureau is to bring about a steady reduction in the scope of its programs and activities by transferring functional responsibilities to other agencies and organizations wherever feasible and by encouraging and assisting the Indians to take over the management of their properties without trusteeship as rapidly as possible.

The basic Indian problem continues to be one of land. In 1946 the 56,000,000 acres of Indian lands, constituting about 3 per cent of the total

area of the U.S., were estimated to be worth $260,000,000. The land has considerably appreciated in value since 1946. Standing timber on Indian lands, estimated at 35,000,000,000 ft. and valued at approximately $175,000,000, is about 2 per cent of the total volume of standing timber in the U.S. In 1952 the Indians owned 401,019 head of livestock and 1,072,978 chickens and other poultry. Their money income from sale of livestock and livestock products was over $22,412,000. The physical plant of the Indian Service is valued in excess of $233,000,000; roads on Indian lands represent an investment of $50,000,000.

Contrary to past trends, the Indian is now the fastest-growing element in the population of the U.S. Although Indians are prone to certain diseases, such as tuberculosis and trachoma, their health has improved during the past 25 years to the point where the death rate is only about 10.5 per thousand, and the live birth rate 29.9 per thousand. During 1952 the Bureau of Indian Affairs operated 59 hospitals with an authorized capacity of 2,881 beds. Average patient load during the calendar year 1952 was 2,425.7 inpatients per day. In addition to patients cared for in Bureau hospitals, an average patient load of 715.6 inpatients per day was cared for in private, community, and other hospitals. In line with the general emphasis on termination objectives, the Bureau is continuing the policy of not operating any health facility where other similar facilities are available and can be utilized.

Education is a vital part of the process of making the Indian an independent citizen. Of the approximately 127,000 Indian children of school age in 1953, over half attended public schools, over one-third attended government schools, and more than ten per cent attended mission and other schools, while the remainder did not attend any schools either because there were no school facilities available to them or for other reasons. Indians have attended colleges in small numbers since colonial days, and an increasing number of Indian youths are preparing themselves for business and professional careers.

In June 1934 the Indian Reorganization Act was passed by the U.S. Congress. It provides: (1) for ending the allotment system and protecting Indian lands; (2) for purchase and restoration of land for Indian use; (3) for tribal self-government under Federal guardianship; (4) for tribal incorporation for business purposes; (5) for educational loans to promote advanced education among Indians; (6) for greater use of Indian employees in the Indian Service; (7) for a revolving loan fund available to incorporated Indian communities to promote their self-support. The Oklahoma Indian Welfare Act of 1936 extended its provisions to Oklahoma tribes. In the same year the Indian Reorganization Act was extended to Alaska. Approximately 282,000 Indians, or over 70 per cent of the total in the U.S. and Alaska, voted to accept the Act. In 1947, 181 tribes, bands, or communities, totaling 195,000 people, had constitutions and by-laws under the Act.

The Indians have made a remarkable record on loans from the revolving fund. Over $21,217,000 was loaned by the U.S. through June 30, 1952, of which only $5,583, or .04 per cent, had been cancelled.

Indians have participated in all wars involving the U.S. It is said that the 1924 Act granting citizenship to the Indian people was an expression of gratitude from the people of the U.S. to the many non-citizen Indians who had volunteered for armed service and had fought with distinction during World War I. During World War II Indians were in the fighting on all battle fronts from Iwo Jima to Salerno, and they distinguished themselves in all theaters. Subsequent to World War II Indians served wherever the U.S. had troops: Korea, Alaska, the Marshall Islands, Japan, Okinawa, Guam and other Pacific islands, England and Germany. The Bureau of Indian Affairs has recorded the following awards to Indians: 71 awards of the Air Medal; 51 of the Silver Star; 47 of the Bronze Star; 34 of the Distinguished Flying Cross; and 3 of the Congressional Medal of Honor. A full-blooded Pima Indian from Arizona, Pfc. Ira H. Hayes, was one of the six men who raised the flag on the summit of Mt. Suribachi on Iwo Jima. A Ute Indian, Pvt. LeRoy Hamlin, was with the first group to make contact with the Russian Army at the Elbe River. Another Ute, Pfc. Harvey Natchees, wearer of the Bronze Star Medal and the Purple Heart, was the first American soldier to enter the center of Berlin.

Indian Summer, a season of warm, pleasant weather in the northern U.S. and southern Canada, occuring late in the fall, usually in October or November. It is characterized by a dry, somewhat hazy atmosphere. Indian summer follows squaw winter, a cold spell marked by the first freezing temperatures of the season. The name Indian summer is supposed to derive from predictions of fair weather made by the Indians in early colonial times. A similar season in England is called Allhallow summer or St. Martin's summer.

Indian Territory, a former territory of the U.S., comprising almost all of present-day Oklahoma. The territory was set apart in 1834 for those Indian tribes—the Cherokees, Choctaws, Creeks, and Chickasaws—which had been removed from their original homes. These tribes were joined in 1842 by the Seminoles, and later arrivals from other tribes were distributed on

seven reservations within the region. In 1889 the central and western part of the territory was opened to white settlers, and the whole of the territory was admitted to the Union as the state of Oklahoma (*q.v.*) on Nov. 16, 1907.

India Rubber (*ĭn'dĭ-ą rŭb'ĕr*). See *Caoutchouc; Rubber.*

Indicator (*ĭn'dĭ-kā-tĕr*), in *chemistry,* a substance that is one color in the presence of acids, another in the presence of alkalies. Indicators such as litmus, methyl orange, and phenol phthalein are used to show the "end point" when an acid is measured against an alkali (titration), and other indicators can be used for other reactions. In *machinery,* any measuring instrument that is read on a dial, but does not make a permanent record, is an indicator. Special devices called indicators are used to show the rapidly changing pressure inside the cylinder of an internal-combustion engine or a steam engine.

Indictment (*ĭn-dīt'mĕnt*), in law, a written accusation of crime made by a grand jury against one or more persons. The purpose of the indictment is to protect the citizen from accusations of crime not based upon probable cause and to apprise him of the exact charges made against him in order that he may intelligently prepare his defense. No charge can be made at the trial which has not been stated in the indictment.

While affording great and needed protection to the accused, the indictment has the disadvantage of making the enforcement of the criminal law slow and expensive. At common law only a charge of treason or felony need be brought by indictment, accusations of lesser crimes being made by an information, a formal charge made by an official.

The largest area of uncertainty concerning indictments is the question of what constitutes "an infamous crime" (the type of crime mentioned in statutes governing the necessity for an indictment). Originally it was one which either by its nature or punishment would tend "to disgrace the accused." Today it is generally held that "infamous crime" is coextensive in meaning with treason and felonies.

Indigestion (*ĭn-dĭ-jĕs'chŭn*), in medicine, irregular functioning of the digestive process, except in cases resulting from organic change. The cause is generally insufficient secretion of gastric juice or the overproduction of acid in the stomach. Symptoms are diminishing appetite, stomach pains, or heartburn. Therapy includes dieting and application of certain drugs.

Indigirka (*ĕn-dyĕ-gĕr'ką*), a large river of eastern Siberia, which rises in the Stanovoi Mts., and flows north about 1,115 m., through the Yakutsk Autonomous S.S.R. into the Arctic Sea. It enters the sea through a large delta about 450 m. E. of the mouth of the Lena. The region traversed by it consists largely of frozen marshes.

Indigo (*ĭn'dĭ-gō*), a vegetable dyestuff that yields a beautiful and very durable blue dye. It is employed extensively in forming a basis for black dye in woolen goods, for dyeing, and for calico printing. The product is obtained from numerous plants of a shrubby and herbaceous character which thrive in equatorial regions. These plants belong mainly to the genus *Indigofera.* The plants are from 2 to 6 ft. tall, have rounded leaves, and bear blue, purple, or white pea-shaped flowers. Ordinarily they are classed with the bean family. They are cut at the time of blooming, which occurs when the plants are about three months old. The seeds are sown early in the spring and the cutting takes place in midsummer. After several months a second crop shoots up, and in some localities a third. The indigo market of Southern Asia centers largely at Bengal, whence large quantities are exported to the ports of Europe and America. The plants which yield indigo are now grown extensively in warmer parts of Europe, Africa, and America, especially in Central America. Historical sources reveal that indigo has been produced in India from remote times. It was imported from that country by the Phoenicians, Greeks, and Romans. In Europe, until the middle of the 17th century, the wood plant *Isatis tinctoria* was used to apply indigo dye to textiles.

Indigo Bunting (*bŭn'tĭng*) or INDIGO BIRD, a North American finch, native to the eastern part of the U.S. and southeastern Canada. It winters in Mexico, Central America, and in Cuba and various other islands of the West Indies. In the spring it migrates as far north as southern Manitoba, Quebec, and Maine. It is about 6 in. long. The general color is greenish-blue, darker around the base of the bill, but the wing and tail are blackish-brown. The bunting nests in low bushes and vines and is noted for its cheerful song. The female is somewhat smaller than the male and has a brown back, brown-streaked breast, and whitish throat and abdomen, with the wings and tail blackish-brown. From three to four eggs of a pale bluish-white, without spots, are laid in the spring.

Indirect Speech (*ĭn-dĭ-rĕct' spēch*) or INDIRECT DISCOURSE, in grammar, the expression of thoughts, sentences, or speeches of another person in a dependent clause, *e.g.,* "The teacher said *that the test was satisfactory.*"

Indirect Tax (*tăks*), a duty imposed upon the manufacturer or importer of goods, as distinguished from a *direct tax,* which is exacted from income and profits. Customs duties and excise taxes are included in the indirect tax system. Before 1913, when the 16th Amendment authorizing Congress to levy and collect income taxes

was ratified, these taxes provided the chief source of revenue of the U.S. government. See also *Tax*.

Indium (*in'dĭ-ŭm*), a metallic element (symbol, In; atomic number, 49; atomic weight, 114.76), found in various mineral ores, in some galenas from Italy, and in the flue dust of the furnaces in which zinc ores are treated. Ferdinand Reich and Theodor Richter discovered the metal in 1863 with the aid of the spectroscope, while analyzing specimens of zinc blende obtained from Freiburg. In a pure state indium has a bluish-silvery luster, and in softness and ductility it resembles lead. It is slightly volatile, has a very low fusion point, and tarnishes slowly in air. See *Chemistry*.

Indo-China (*in'dō-chī'nȧ*), a territory in southeastern Asia, comprising the three independent countries of Cambodia, Laos, and Viet Nam (*qq.v.*). Viet Nam is divided into two political areas, known as North Viet Nam and South Viet Nam, as a result of an international agreement reached at Geneva, Switzerland, in 1954.

Indo-China, as a geographical area, is bounded on the N. by China, on the E. by the Gulf of Tonkin and the South China Sea, on the S. by the Gulf of Siam and the South China Sea, and on the W. by Siam (Thailand). It has a total area of *ca.* 285,000 sq. m. and a population of some 32,000,000.

The southern and central parts of Viet Nam, southern Laos, and Cambodia are the chief agricultural sections. Some of the greatest rice regions in the world are located here. Fishing is carried on in the coast regions and in the interior lakes. Mining is carried on in the central portions of Viet Nam. Mineral deposits in Indo-China include coal, iron ore, zinc, gold, and copper. The chief exports of the region are rice, rubber, fish, hides, and corn.

INDO-CHINA. BRAHMAN TEMPLE SCULPTURE

The history of Indo-China is one of warring states. The pre-Christian kingdoms of the region maintained a constant rivalry with one another and with the neighboring states of South Asia. At the time of the first French intervention, the situation was particularly unstable. The French conquest of Cochin China began in 1861; Cambodia became a French protectorate in 1863, Annam in 1884, and Tonkin in 1885. A unified government in Indo-China was formed in 1887. Laos, ceded by Siam, was incorporated in 1893. Siam ceded Battambang in 1907. The country was occupied by Japan in 1941, during World War II, and the Japanese established numerous military and naval bases in Indo-China. After Japan's surrender, Sept. 2, 1945, France pledged autonomy to Indo-China within the framework of the French Union. However, Viet Nam became the scene of a bitter civil war between the nationalists, who favored cooperation with France, and pro-Communists under Ho Chi Minh, who opposed any connection with the West. Beginning in 1949, a series of agreements defining French relations with Viet Nam, Laos, and Cambodia were signed, giving increasing autonomy to these states in the framework of the French Union. The civil war continued unabated, with the Communist forces receiving powerful support from Red China, until July 1954, when an armistice was signed at Geneva, Switzerland. The truce terms split Viet Nam at the 17th parallel, the northern part being turned over to the Communists; Laos lost two northern provinces, but Cambodia retained its territory unimpaired. The areas had become virtually independent of one another and of France (*q.v.*) by 1955.

Indo-European (*ĭn'dō-ū-rō-pē'ȩn*), INDO-GERMANIC, or ARYAN, a large family of inflective languages which include Albanian, Armenian, Baltic, Celtic, Germanic, Greek, Hittite, Indo-Aryan, Iranian, Romance, Slavonic, and Tocharian. All these branches descended from a parent ancestral tongue which prevailed at a remote period in Central Asia, and spread through succeeding centuries into India and westward through Asia to the western extremities of Europe. Study has demonstrated that these languages have a basic similarity in structure as to roots, affixes, composite forms, with kindred variations of nouns, adjectives, pronouns, and verbs through eight cases, three numbers, including a dual, and a variety of tenses; certain features in syntax and word order also are common to all Indo-European languages.

It is impossible to establish a parallel between the Aryan language and the Aryan race, because

there is no clear record of the Indo-European peoples before the second millennium B.C. We can learn nothing of their language before the time of the appearance of the religious hymns, the Vedas, which date roughly from 2000 to 1400 B.C., and by this time the Indo-Europeans had already differentiated into several main divisions. The contention of some anthropologists that the original Indo-Europeans were a tall, blue-eyed, long-headed people has not been proven.

Indonesia (*in-dô-nē'shī-ä*), REPUBLIC OF, a country comprising all of the former Dutch island possessions in the Malay Archipelago (with the exception of Netherlands New Guinea), lying in the Pacific Ocean between the southeastern tip of the Asiatic mainland and northern Australia. The group includes Sumatra, Borneo (except British North Borneo), Java, Celebes, and the Molucca and Sunda islands (*qq.v.*).

The total area of the republic is 743,855 sq. m., including thousands of small chainlike island groups. The topography ranges from the rugged mountain terrain of Borneo, the Moluccas, and Celebes, to the broad, swampy planes on the eastern coast of Sumatra and the terraced hills of Java. The climate is generally warm and tropical with a December-to-March rainy season. The chief agricultural products are rice, maize, sweet potatoes, soy beans, rubber, pepper, tea, and coffee. The mineral resources include petroleum and rich deposits of tin and bauxite. Lesser amounts of coal, gold, silver, manganese, and nickel are mined.

Prior to World War II, the islands were colonies of the Dutch crown, known as the Dutch or The Netherlands East Indies. Following the Japanese occupation of Indonesia (1942-45) armed clashes broke out between the Dutch, who attempted to re-establish their former government, and a strong nationalist movement that demanded freedom from European control. A truce was signed in October 1946, and in March 1947 The Netherlands government agreed to the establishment of a United States of Indonesia (U.S.I.) which came into being on Jan 5, 1950. The U.S.I. was established as a federation of states having equality with The Netherlands under the Dutch crown. In 1950, however, a single state, the Republic of Indonesia, replaced the federation and a provisional constitution was adopted. In the same year Indonesia joined the U.N. As a result of the continued dispute over West New Guinea, where Dutch control remained, the union of the two countries was dissolved in 1954. The first national parliamentary elections were held in September 1955. Population, *ca.* 81,000,000.

Indra (*in'drä*), a deity of the Hindus, worshiped as the supreme god throughout the Vedic period. He lost his supremacy by the rise of Brahma, Siva, and Vishnu (*qq.v.*), and is now assigned a subordinate place in the Pantheon. In paintings and sculpture he is represented with numerous eyes and four arms and is seated on an elephant. His powers include the control of rain and shade, the hurling of thunderbolts, and the restoring of the sun to the sky. He has also been assigned a supervisory influence of Swarga, a paradise in which pious men and inferior deities dwell in eternal felicity. Indra plays an important part in Hindu literature and legend.

Indre (*in'dr*), a department of central France, formerly a part of the province of Berry. It has an area of 2,664 sq. m., drained by the Indre and Creuse Rivers. The surface is level and the region is devoted primarily to agriculture and stock raising. The chief products include grains, fruits, vegetables, grapes and wine, honey, and wax. Foundries for nickel, copper, and bronze, and mills for the manufacture of woolen, cotton, and linen goods are located near the capital city, Châteauroux. Population, 1946, 252,075.

Indre-et-Loire (*in'dr-ä-lwär*), a department of north central France, having an area of 2,377 sq. m. The level countryside is irrigated by the Loire, Creuse, Cher, and Vienne Rivers and the region is devoted primarily to agriculture. The chief products include wine grapes, fruit, hemp, oats, and flowers. The historic capital city of Tours (*q.v.*) is famous for the manufacture of fine silks and for the production of agricultural machinery and railroad equipment. Other important cities of the department are Amboise, Abilly, Bléré. Population, 1946, 349,685.

Induction (*in-dŭk'shŭn*), a term in logic which implies the process of reasoning which proceeds from the particular to the general. It is used in contradistinction to deduction, a process of reasoning from the general to the particular. The inductive method involves the process of proceeding from the known to the unknown, and obtaining a conclusion broader and deeper than the premises. Induction is the process by which it is concluded that what is true of certain individuals of a class is true of the whole class, and what is true in certain times will be true at all times. The impossibility of observing all particulars makes it necessary to reason inductively with care, lest the conclusion be erroneous. The basis of induction is the established fact that nature is uniform, and by observing in detail every material fact the conclusion arrived at must be true.

Induction, in electrical science, the ability of an electrically charged body to induce an electrical charge in a near-by conductor without actual contact with it. If a glass rod, positively charged, for example, is brought near the end of a metal rod, the metal rod will show a negative charge where it is approached by the glass rod,

but the far end of the metal rod will bear a positive charge. These charges in the metal will remain until the glass rod is removed, and then the metal rod will be again neutral, *i.e.*, without electrical charge. It is assumed that the positively charged glass rod has attracted the electrons in the metal to the end near the glass rod. (Electrons are particles of negative electricity.) Since these particles have been drawn from atoms in the whole of the rod, the atoms lack some electrons at the far end of the rod, and so bear a positive charge. If, conversely, a negatively charged rubber rod had been used, instead of the glass rod, the electrons in the metal would have been repelled, and the near end of the metal rod would have been positively charged, while the far end of the rod would have been negatively charged.

Magnetic induction refers to the magnetizing of iron or steel by placing it in a magnetic field. Iron, so made into a magnet, soon loses its magnetism after being removed from the magnetic field. Steel remains permanently magnetized after it is removed from the field.

Heinrich D. Ruhmkorff (1803-77), a German inventor, developed the induction coil (*q.v.*), by which induced currents of alternating type and of high potential are produced in a long secondary coil by making and breaking the current of electricity in a primary short coil of wire. The principle of induction is also illustrated by the Leyden jar, in which mutual induction takes place between two coatings, the charged coating inducing an opposite charge in the other coating. (The two conductive coatings are insulated from each other by glass.) See also *Electricity; Electron; Electrostatic Induction.*

Induction Coil, or RUHMKORFF COIL, a device used to create induced alternative electric currents of high potential difference. Michael Faraday (*q.v.*) was the first to announce the fundamental fact of electromagnetic induction (1831). The induction coil was invented by Heinrich Ruhmkorff in 1851. The essential parts are a soft iron core, a primary coil of insulated wire connected with a battery, a secondary coil of fine insulated wire, an interrupter operating automatically between the battery and the primary coil, a condenser connected across the interrupter, and a switch to disconnect the circuit. When the switch is turned on, current from the battery flows through the primary coil and magnetizes the iron core. The soft iron armature attached to a spring is attracted and breaks the primary current. This, in turn, causes the core to be demagnetized and the armature is restored by the spring to its initial position, where it again closes the primary circuit. The vibration of the armature is repeated in rapid succession. As a result of the large number of turns of fine wire in the secondary coil an induced current is produced at a high potential difference. When leads from the ends of the secondary coil are brought near to each other, a spark passes from one lead to the other. Induction coils are used where high voltage and low amperage are needed, such as in the ignition systems of automobiles, for operating discharge tubes and X-ray tubes, and in telephones.

The *tesla coil* is an induction coil which produces immense voltage at very low amperage. The *transformer* uses alternating current in its primary circuit and no interrupter is required. It is used to step up or lower the voltage on power lines. See *Electromagnetism.*

Indulgence (*in-dŭl'jĕns*), a term signifying the extra-sacramental remission of temporal punishment (in this world or in purgatory), resulting from the commission of a sin (*q.v.*). Indulgence is an element of the doctrine of the Roman Catholic Church. Before indulgence can be granted the sin must have previously been forgiven by the sacrament of penance (*q.v.*). According to Roman Catholic concept every sin is punishable in a twofold way: by a temporary punishment and by punishment in eternity. While only penance can remove the eternal punishment, indulgence may remove the temporal punishment. Partial indulgence is granted for a specified length of time, while total indulgence (plenary) means the remission of the entire temporal punishment.

Indulgence can be granted by the Pope, by bishops, and by members of the Church especially authorized by the bishops. As a rule indulgence is granted to those who do good deeds, give alms, or fight heretics. Observation of prayers, visits to churches, and pilgrimages are usually requested.

The abuse of indulgence in the 15th and 16th centuries was one of the causes for the emergence of the Protestant movement. At that time, remission could be obtained merely for money. In 1517, Luther published his theses against the selling of indulgences. Luther expostulated that the Church could remit only ecclesiastical penalties, while the remission of divine punishment had to be left to God. As a sequel to Luther's Protestant movement, the Catholic Council of Trent ruled in 1563 that indulgence should never be granted only for money.

Indus (*ĭn'dŭs*), an important river in the northwestern part of India. It rises in Tibet, on the north side of the Himalaya Mts., flows northwest, then curves and assumes a course toward the southwest. The length is about 1,800 m. It has a basin of 372,000 sq. m., and a delta extending about 130 m. along the coast of the Arabian Sea. Its source is 18,000 ft. above the sea, making the flow rapid in many portions of its course. The Indus is valuable as a highway of commerce and

vessels enter safely by a number of the mouths of the delta. Among the tributaries are the Gartok, which enters it before it passes the Himalayas, the Shayok, the Sutley, the Chenab, and the Kabul. It is navigable to its confluence with the Kabul, about 900 m. from the sea. Many edible fish, waterfowl, and crocodiles are abundant. The valley of the Indus is famed for its fertility.

Industrial Codes (*in-dŭs'trĭ-ăl eōdz*), a system of rules drawn up under the *National Industrial Recovery Act* of 1933 (N.R.A.) (*q.v.*) by trade associations representing every industry, and approved by the Federal Code Administrator, appointed by the President. The codes, establishing minimum work weeks, minimum wages and salaries, providing for the elimination of destructive trade practices, and maintaining prices in order to assure a reasonable profit, were mandatory on all concerns within each industry. The industrial codes terminated when the U.S. Supreme Court decided, in the case of the Schechter Poultry Corp. against the U.S. in 1935, that the National Industrial Recovery Act was unconstitutional. Some firms continued to operate voluntarily under the provisions of the codes. The National Labor Relations Act (*q.v.*), passed in 1935, and the Fair Labor Standards Act (*q.v.*) passed in 1938, contain many of the principles of the National Industrial Recovery Act.

Industrial Revolution (*rĕv'ô-lū'shŭn*), in history and economics, the transition from a system largely agricultural to industrialization or manufacture of goods by machine. This change was noticeable throughout the world in the early 19th century, but in England between 1780 and 1840, it was particularly decisive. Intensification of agriculture (McCormick's reaper, 1831) coincided with a succession of inventions important in factory production (Watt's steam engine, 1769; Hargreaves' "spinning jenny," 1770, etc.). Production of iron increased as did the production of cotton (Whitney's cotton gin, 1793) and many other commodities. This resulted in increased and improved shipping and road traffic. There was an increase of population all over Europe and people began to mass in industrial centers. The living standard among the working classes dropped accordingly. The industrial revolution in France and central Europe began 20 or 30 years later than in England. In the U.S. it came about 50 years later. The economic and sociological phenomena were everywhere identical.

Industrial School, or VOCATIONAL SCHOOL, an institution devoted to the instruction for specific trades or vocations, especially in the industrial arts. Many institutions of this character are supported either jointly by the national and state governments, or by either of them separately. Another class of these schools is maintained as private institutions, in which these arts are combined in courses with other branches of learning. Many are coeducational. The term is likewise extended to many reformatory institutions established under state supervision in which youthful offenders as well as vagrant children are confined for correctional purposes. They aim to teach the arts of industry along with the elements of an education. Many governments support industrial schools of this character for both sexes in different localities. The schools in which industrial and mechanical arts are taught as regular branches of study are abundant in European countries. In the U.S. well over 2,000,000 people of all ages are enrolled annually in Federally aided vocational schools, including agricultural, trade and industrial, and home economics courses. See also *Rehabilitation*.

Inertia (*in-ĕr'shĭ-ä*), the incapability of matter to change its state, whether that be one of motion or of rest. From this follow the two laws: That a body at rest continues at rest forever unless acted upon by some force; and that a body in motion continues in motion forever unless some counteractive force, like that of gravity, acts upon it. The resistance which, especially at first, a body at rest gives to a force operating to move it, is called the *power of inertia*. Newton established the idea that inertia can be measured and that it is a fundamental property of matter.

Infallibility (*in-făl'i-bĭl'i-tĭ*), a doctrine of the Roman Catholic Church put into effect by the Vatican Council of 1870, which decreed the infallibility of the Pope as the head of the Church. The doctrine holds that the Pope is infallible since he is the Vicar of Christ and therefore guided by the Holy Ghost to see the truth. This infallibility refers only to decisions of the Pope on questions of faith and ethics, and then only when pronounced *ex cathedra*.

In earlier times infallibility was ascribed to the decisions of the Church Councils—the gatherings of all bishops. This theory of the infallibility of the councils was of utmost importance at the end of the Middle Ages. At that time, state and Church were in conflict, and conflicts within the Church sometimes even led to the election of two Popes. The Council's power then equaled an authority within the Church above the Pope.

The spiritual leaders of the Reformation believed in the infallibility of the revelation, but disputed the tenet that the Church shared in this infallibility. Thus, they taught that the individual believer can find the infallible truth for himself in the Scriptures.

Infant (*ĭn'fănt*), in law, a person who is too young to bind himself by what he says, or in a contract. In the law of England and America the term is applied to all persons who have not attained their majority, which is reached at the

age of 21 years. Females reach their majority in some states and countries at the age of 18 years. In general the term minor is applied to a male who is under 21 and to a female under 18 years of age. Contracts made by infants are not binding, except for necessaries essential to their life and health. Though infants may be punished for criminal offenses, the penalty inflicted varies somewhat in degree and kind from that imposed upon adults. The father is the natural guardian of his children until they are 21 years of age, and in case of his death or inability, in some states, this power becomes vested in the mother. A minor cannot contract marriage, except with the consent of the parents or guardians. See *Age, Legal.*

Infantile Paralysis (*ĭn'făn-tīl pă-răl'ĭ-sĭs*), a communicable virus disease of the central nervous system known scientifically as *anterior poliomyelitis.* The first signs of the disease may be one or a combination of fatigue, fever, nausea, vomiting, headache, and stiff neck. There are two general forms of the disease: non-paralytic (abortive) and paralytic. The degree of paralysis remaining after the acute stage has passed depends on the areas of the brain and spinal cord affected by the virus. The disease can occur at any age, most commonly in children under ten years of age. Males are more frequently affected than females. Although there is no cure for poliomyelitis, there exist two effective preventives, which were developed under the sponsorship of the National Foundation-March of Dimes. Since 1955, when the vaccine developed by Dr. Jonas Salk (*q.v.*) was released, there has been a 97 per cent reduction in the annual toll of polio in the U.S. In 1962 government approval was given to an oral polio vaccine, developed by Dr. Albert Sabin, but the application of type III of this vaccine was later found to arouse the disease in certain adults. See also *Kenny, Elizabeth.*

Infantry (*ĭn'făn-trĭ*), the largest and most important combatant branch of the military forces of all countries, generally marching and fighting on foot, armed with rifles and bayonets. The earliest known soldiers were foot soldiers. Infantry tactics have varied through the ages, depending upon the type of weapon currently in use. The solid phalanx moving upon the enemy 10 to 12 files deep was employed by the ancient Greeks and Romans, when infantrymen were armed with pikes. Following the downfall of Rome, foot soldiers practically disappeared as an important factor in warfare, cavalry and knights in individual combat eclipsing them. Under the influence of the Swiss mountaineers and the expert bowmen of England, the undisciplined and ill equipped infantry of the Dark Ages gave way in the 14th century to better organized, well trained troops. With the introduction of firearms in the same period, the foot soldier came back into his own. Improvement in organization and tactics has been gradual, but military leaders have all recognized the importance of a readily maneuverable infantry and have improved its status and tactics accordingly. A change in the use of infantry came with the introduction of trench warfare in the second half of the 19th century. In World War I, particularly, foot soldiers maneuvered largely from trenches. During World War II, greater mobility of infantry was realized in motorized and mechanized warfare (see *Troops, Mechanized and Motorized*). Paratroopers (see *Parachute*) also constitute a branch of infantry.

Infectious Disease (*ĭn-fĕk'shŭs dĭ-zēz'*), in medicine, any kind of disease which is spread by infection, *i.e.*, by germs, such as tuberculosis, scarlet fever, smallpox, etc., in which the germs are transferred from person to person either through mucus or through excrements. Typhoid fever and cholera, for instance, are not infectious in that sense, since the germs are transferred by water or food.

Inferiority Complex (*ĭn-fē-rĭ-ŏr'ĭ-tĭ kŏm-plĕks'*), in psychology, a pathological state of mind and the resultant behavior and abnormal reactions of a person thus afflicted. It is caused by a continuous, generally subconscious, sometimes semiconscious, feeling of inferiority to others, either as to general intelligence, character, or ability to fulfill specific tasks. The usual symptoms are an exaggeratedly dictatorial attitude toward others, an aggressiveness not called for by circumstances, and instinctive self-defense against imaginary affronts. On the other hand, the same person may, in some instances, be cowardly and overhumble. General unsteadiness and a fluctuation of opinion are the results of this attitude.

Inferno (*ĭn-fĕr'nō*), Italian, meaning the lower regions of the spiritual realm, hell, or the underworld. The expression is more especially applied to Dante's description of the nether regions in his "Divine Comedy" (*q.v.*).

Infiltration (*ĭn-fĭl-trā'shŭn*), in medicine, permeation of the tissues by a substance not normally in existence there.

Infinitesimal Calculus (*ĭn-fĭn-ĭ-tĕs'ĭ-măl kăl'kū-lŭs*), the branch of calculus (*q.v.*) which deals with small quantities. An infinitesimal is a variable which becomes and remains smaller than a previously assigned positive value, however small. In applied mathematics infinitesimals may be used to replace differentials and vice versa. Slopes and lengths of curves or the limiting values of indeterminate ratios may be computed with this replacement theorem.

Infinity (*ĭn-fĭn'ĭ-tĭ*). In mathematics, when a variable grows larger and larger without bound it is said to become infinite or tend to infinity.

The familiar sequence of natural numbers, 1, 2, 3, 4, 5, 6, ... goes on and on, the numbers getting larger and larger. Hence, if a variable has as its values the natural numbers, it tends to infinity. Similarly, if a variable has the successive values 1, 3, 5, 7, 9, ... , or the successive values, 5, 10, 15, 20, 25, ... , or the successive values 10, 100, 1,000, 10,000 . . . . , etc., the variable is said to tend to infinity. In each of these cases an essential characteristic is that no matter how large a number we select, the value of the variable will eventually get larger than this number and stay larger than it. Thus, if we consider the values of the variable to be 1, 3, 5, 7, 9, ... , and name as a large number 10,000, the variable will eventually get larger and stay larger than 10,000; in fact, as soon as it reaches 10,001. If we name a larger number, say 50,000,000, the variable will also eventually get larger than this number and stay larger than it; in fact, as soon as it reaches 50,000,001. No matter how large a number we name, a variable that takes the values 1, 3, 5, 7, 9, ... will eventually exceed and stay larger than this number. This characteristic is taken as the definition of a variable tending to infinity, and we state that a variable, x, is said to *tend to infinity* or *become infinite*, denoted $x \to \infty$, if, no matter how large a number N is selected, x will eventually exceed and remain greater than N.

The word infinity as used in the sense just discussed does not represent a number but rather a mode of variation. It is in this sense that the word is usually used in elementary mathematics. For example, if we consider the values of the fraction $1/x$ when x takes successively the values 1, .1, .01, .001, .0001, ... , we find that the fraction has successively the values 1, 10, 100, 1,000, 10,000, . . . Thus as x approaches 0 the value of the fraction tends to infinity. This is often denoted by the symbol $\lim_{x \to 0} \frac{1}{x} = \infty$. In trigonometry this situation arises in connection with the tangent, cotangent, secant, and cosecant. For example, the tangent of 90° is undefined, but if an angle is thought of as approaching 90° through first-quadrant values, the value of the tangent becomes infinite. This behavior of the tangent is sometimes symbolized by the statement: $\tan 90° = \infty$.

In elementary mathematics the existence of parallel lines makes it necessary to have exceptions in many rather simple propositions. For example, two straight lines intersect in one and only one point except when they are parallel; and the line joining two points on two sides of a triangle meets the third side of the triangle, except when it is parallel to the third side. In algebra a similar situation arises in performing elementary operations on numbers; for example, when only positive whole numbers are known subtraction can be performed, except when the subtrahend is larger than or equal to the minuend. However, in algebra, this exception is removed by introducing new types of numbers, in the case mentioned, the negative numbers. This suggests that the exceptional cases that arise in geometry might be removed by introducing new geometrical elements. To do this, consider two intersecting lines AB and PB (see Fig. 1). Hold the line AB fixed

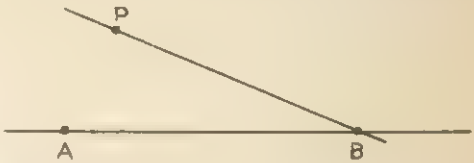


Figure 1

and allow the line PB to rotate slowly counterclockwise around the point P. As it rotates the point of intersection, B, of PB and AB, moves farther and farther off to the right, and the distance AB tends to infinity. Now, when the lines are parallel, a new geometrical element is introduced by assigning a point of intersection to parallel lines. Such a point is called an *ideal point* or a *point at infinity*. When this new type of point is included in geometry we can say that all lines, parallel or not, meet in one and only one point. These ideal points or points at infinity remove the need for exceptions due to parallelism and permit the replacement of the statement "parallel lines do not meet" by the statement "parallel lines meet at infinity."

In the last century Georg Cantor (1845-1918) studied the properties of unending sets such as 1, 2, 3, 4, 5 . . . . In his study the question arose as to whether such sets as 1, 2, 3, 4, 5, 6, ... and 2, 4, 6, 8, 10, 12, ... have the same number of elements or a different number of elements. Cantor relied on the basic idea involved in counting to decide this question, namely, one to one correspondence. Since the cardinal numbers of two finite sets are equal if they can be put in one-to-one correspondence, Cantor used this same definition for equality of the cardinal numbers of two infinite sets. He then assigned symbols to the cardinal numbers of infinite sets and defined transfinite or infinite cardinal numbers. One consequence of his work was that it was seen that the axiom that the whole is greater than any of its parts is not applicable to infinite sets, for the set 2, 4, 6, 8, 10, 12, ... is a part of the set 1, 2, 3, 4, 5, 6, ... and yet these sets have equal transfinite numbers. Cantor's discoveries have helped to solve some of the paradoxes which Zeno proposed over 2,000 years ago. Furthermore, his rejection of the axiom relating to the whole and its parts, along with the rejection of the parallel axiom by Lobachevski, Bolyai, and Riemann, led

to much greater freedom of thought in mathematics and hence to many fruitful discoveries as well as to a clearer understanding of the nature of mathematics.

The term is also employed in music to designate certain forms, sometimes called *perpetual fugues,* which are so constructed that the performance may be incessantly repeated, their ends leading to their beginnings.

Inflammation (*ĭn-flă-mā'shŭn*), in medicine, a process of mobilizing the natural defense mechanism of body cells invaded by bacteria, or irritated by excessive cold or heat, poisons, or other chemical or physical agents. In inflammation local blood vessels enlarge, producing increased heat and redness of the skin. As blood plasma and cells flow into the tissues, swelling and pain (from pressure on nerves) result. There is marked interference with function of the involved area. Pus (*q.v.*) develops when the natural resistance of the cells can not counteract the invading agent.

Inflation (*ĭn-flā'shŭn*), a sharp rise of prices, caused by expansion in the total supply of money which people have and want to spend, when this supply is greater than the supply of goods available for purchase. The ancient custom of coin-chipping or issuance of inferior money and the more recent practice by governments of the issuance of unsupported paper currency or of the expansion of credit are chief sources of inflation. Major additions to the supply of precious metals, such as occurred following the Spanish conquests in Central and South America and the discoveries of new large gold deposits in California and Alaska, are also associated with inflation. Governmental policies in wartime or postwar periods, or in times of major defense preparations, usually start the process of "cheapening" the currency, because budget deficits are financed by the issuance of irredeemable paper money (*e.g.,* in France, 1789-97; Russia and Germany, following World War I; in the U.S., during the Revolution and the Civil War). The floating of bonds to a central bank is another form of "creating" credit, leading to inflation. Historically, controls on inflation have taken the form of price restraints, special levies, confiscatory laws, and corporal punishment—all with limited or no success. In the U.S., effective restraint of price rises by direct administrative controls was accomplished during the course of World War II. Subsequent abolition of controls, however, permitted inflation to exert a strong upward pressure on prices. From 1945 to mid-1950, the index price of all commodities rose by 46 per cent. The outbreak of the Korean War in June 1950 caused resumption of price controls on a limited scale, terminating for the most part on June 30, 1951. After that date there began an expansion in the supply of goods, resulting in a slight easing of the inflation. See also *Consumer Price Index.*

Inflection (*ĭn-flĕk'shŭn*), the term used in grammar to designate the variation of the terminations of nouns and pronouns in declension, verbs in conjugation, and adjectives and adverbs in comparison. The agglutinative languages, such as the Turkish and the Hungarian, combine many of the root words, while in the highly inflectional tongues, such as the German and Old English, the endings of many words are inflected.

Inflorescence (*ĭn-flô-rĕs'sẹns*), the arrangement of flowers upon a branch or stem. When the axis in a flower cluster terminates with a flower, the inflorescence is said to be definite; otherwise it is designated as indefinite, indeterminate, centripetal, botryose, *etc.,* depending on the distribution of flowers along the steam.

Influenza (*ĭn-flū-ĕn'zą*) or GRIPPE, an acute infection characterized by sudden onset of chills and fever, accompanied by aching muscles, symptoms of upper respiratory tract involvement, and general weakness. It is caused by one or more viruses of the influenza group. Currently, four families of influenza type A, two of type B, and one distinct Asian type have been identified. An ever-present infection, influenza at time assumes epidemic and pandemic proportions. In 1918-19 about 20,000,000 persons died of the disease (the largest number of people who ever succumbed to a single epidemic in the history of the world). In 1957 the Asian influenza epidemic spread from China to the rest of the world. In the U.S. a relatively mild epidemic affected over one-fourth of the population. No specific drug effective against influenza has yet been developed, but vaccination has provided some protection from the disease.

Information Please (*ĭn-fŏr-mā'shŭn plēz*), a well-known commercial radio (and later television) program (1938-52), in which four experts in various fields were asked general questions submitted by listeners. Clifton Fadiman (*q.v.*) served as master of ceremonies. So-called "regulars" on the program were John Kieran and Franklin P. Adams (*qq.v.*), who were joined by guest "experts" in each program.

Infrared Radiation (*ĭn'frā*), electromagnetic waves of frequencies intermediate between visible light and radio waves. Infrared rays produce a sensation of heat and are responsible for the transmission of heat in a vacuum. They are emitted by hot bodies and their intensity is measured with thermopiles. They are strongly absorbed by glass but freely transmitted by rock salt which may be used in infrared ray optics. Infrared ray absorption spectra are important in quantum theory (*q.v.*) and in determining the structure of organic compounds.

Infusorial Earth. See *Kieselguhr.*

Inge (*ĭng*), WILLIAM RALPH, clergyman, born in Craike, England, June 6, 1860; died in Wallingford, Feb. 26, 1954. Dean of St. Paul's Cathedral, London (1911-34), he was called the "Gloomy Dean" because of his philosophical pessimism. His writings include "Lay Thoughts of a Dean" (1926) and "The Fall of the Idols" (1940).

Ingelow (*ĭn'jē-lō*), JEAN, poet and novelist, born in Boston, England, March 17, 1820; died in London, July 20, 1897. A popular lyric poet, she wrote "Poems" (1863), "The Story of Doom and Other Poems" (1867), and "Poems" (1885). She also wrote successful novels, such as "Sarah de Berenger" (1880), and several well-loved children's books, including "Mopsa the Fairy" (1869). Her poetry is distinguished by its simple lyricism and wealth of imagination.

Ingenieros (*ēn-hā-nyā'rōs*), JOSÉ, psychiatrist and sociologist, born in Buenos Aires, Argentina, April 24, 1877; died there, Oct. 31, 1925. A disciple of Auguste Comte and Herbert Spencer (*qq.v.*), he was one of Latin America's foremost intellectuals of recent times and one of the earliest Latin-American scholars to subject the traditional social sciences to the rigorous methodology of positivism (*q.v.*). In a critique of the economic interpretation of history, he explained economic trends in terms of ultimate biological processes. In addition to treatises on sociological subjects, he wrote extensively on Argentinian history and thought.

Ingermanland (*ĭng'gēr-mən-lənd*), also INGRIA, an historic district in the northwestern U.S.S.R., part of the Leningrad oblast, situated south of the Gulf of Finland. It takes its name from its earliest inhabitants, a Finnic people known as the Ingers. Originally part of Novgorod, its possession was a continual source of conflict between Sweden and Russia from the 14th to the 17th centuries. Captured by Sweden in 1617, it was retaken by Peter the Great in 1703 and finally incorporated into the Russian empire in 1721.

Ingersoll (*ĭn'gēr-sŭl*), a town in Oxford County, southern Ontario, Canada, *ca.* 20 m. N.E. of London, on the Thames River and the Canadian National R.R. Surrounded by a farming area, it has lumbering, furniture and hardware manufacturing, and canning. Population, 1951, 6,524.

Ingersoll, JARED, jurist, born in New Haven, Conn., Oct. 27, 1749; died in Philadelphia, Pa., Oct. 31, 1822. The son of Jared Ingersoll (1722-81), lawyer and public official, he was graduated (1766) from Yale Univ., studied in London and Paris, and was admitted to the Philadelphia bar in 1773. One of that city's outstanding legal talents, he argued many cases before the Supreme Court. Also an articulate advocate of the American Revolution, he served in the Continental Congress (1780-81) and was a delegate to the Constitutional Convention (1787). Ingersoll was Pennsylvania's attorney general for two terms (1790-99, 1811-17), and U.S. district attorney (1800-01). In 1812 he was the unsuccessful candidate for the U.S. Vice Presidency on the Federalist ticket. Subsequently he served as a district judge in Philadelphia (1821-22).

Ingersoll, ROBERT GREEN, lawyer and author, known as the "Great Agnostic," born in Dresden, N.Y., Aug. 11, 1833; died in Dobbs Ferry, N.Y., July 21, 1899. The son of a clergyman, he moved with his family to Illinois at an early age. Admitted to the bar in 1854, he established his law practice in Peoria, Ill., his legal and oratorical talent quickly winning him recognition. During the Civil War he served with the Union forces as a colonel of cavalry (1862-63). He was attorney-general of Illinois (1867-69), but his antireligious views prevented him from attaining higher office, and he devoted much time to his law practice and to the lecture platform. Famous among his lectures were "The Gods" (1872), "Some Mistakes of Moses" (1879), "Why I Am an Agnostic" (1896), and "Superstition" (1898). Ingersoll's oratorical eloquence also served the cause of Republican politics for more than 30 years, and his "Plumed Knight" speech, in which he nominated James G. Blaine for U.S. President at the 1876 Republican national convention, became especially famous. His lectures and speeches, published as "The Works of Robert G. Ingersoll" (12 vols., 1900), have been reprinted many times.

Ingraham (*ĭn'grā-əm*), DUNCAN NATHANIEL, naval officer, born in Charleston, S.C., Dec. 6, 1802; died there Oct. 16, 1891. Entering the U.S. Navy as a midshipman in 1812, he served in the War of 1812 and in the Mexican War. As commander of the *St. Louis* in the Mediterranean (1853), he secured the release in Smyrna harbor of Martin Koszta, a Hungarian political exile who, despite his declared intention of becoming an American citizen, was held a prisoner by Austrian authorities. Early in 1861 he resigned from the Federal service to command Confederate naval forces.

Ingram (*ĭng'grăm*), ARTHUR FOLEY WINNINGTON, prelate, born in Worcestershire, England, Jan. 26, 1856; died in London, May 26, 1946. Educated at Oxford Univ., he was made curate of St. Mary's in Shrewsbury (1884), where he began the social work in London's East End slums that was to be his lifelong interest. It was there, in 1888, that he established Oxford House, a social settlement. After holding several rectorships, he became Bishop of London (1901-39), a position in which he was widely influential in promoting the work of the Church of England. Among his works are "Work in Great Cities" (1896), "The Gospel in Action," "What a Layman Should Believe" (1938),

Courtesy Metropolitan Museum of Art, N. Y.

ODALISQUE EN GRISAILLE. PAINTING BY INGRES

and "Fifty Years' Work in London" (1940).

Ingres (*ăn'gr'*), JEAN AUGUSTE DOMINIQUE, painter, born in Montauban, France, Aug. 29, 1780; died in Paris, Jan. 13, 1867. After elementary instruction in Toulouse, he went to Paris to study painting with Jacques Louis David (*q.v.*), leader of the French Classicists. With his work, "Ambassadors of Agamemnon in the Tent of Achilles," Ingres gained the Grand Prix in 1801. This enabled him to study at the Acad. of France in Rome from 1806 to 1820. He devoted himself principally to portrait, mythological and historical painting. Distinct contours and clear shaping characterize his works, which exhibit clearly classical tendencies. His "The Vow of Louis XIII," painted for the Cathedral of Montauban, brought him great prestige. He was appointed director of the Acad. of France in Rome in the 1830s, returning to his native land in 1841. In the year of his death, 1867, a *Musée Ingres* was opened at Montauban, containing most of his paintings and drawings. Among Ingres' most famous canvases are: "Mme. la Comtesse de Tournon," "Grande Odalisque," "Entry of Charles V Into Paris," "Apotheosis of Homer," "Apotheosis of Napoleon I," and "Jeanne d'Arc."

Inheritance Tax (*in-hĕr'it-ăns tăks*), an assessment on the property passing from a deceased person to his heirs or legatees. The Romans imposed a tax of this kind before the advent of the Christian era, and it has been the source of considerable revenue in the countries of Europe for many centuries. Since the time of Gladstone such taxes are known as death duties in England, and this term is applied in many parts of the British Empire where such assessments are made, especially in Australia and New Zealand. The U.S. Government imposed an inheritance tax during the Civil War, but subsequently it was repealed. In 1916 the Federal government enacted an estate tax, which has continued in effect, although it has been amended from time to time. The estate tax differs from the inheritance tax in that the former is imposed on the transfer of property by the estate of the decedent, while the latter is imposed on the property received by the heir or legatee. Inheritance or estate taxes are imposed by all of the states except Nevada. In most cases the rate is progressive, graduated on a percentage basis according to the size of the estate or the amount inherited and the degree of relationship. An exemption is usually allowed. The Federal government and some of the states provide a flat exemption. In most of the states, however, the exemption varies with the degree of relationship between the heir and the decedent.

Inia (*in'ĭ-ä*), the name of a mammal classed with the dolphin family, of which only one species is known. The body is 7 to 9 ft. in length, and the color is usually pink mixed somewhat with

black. It is found in the lakes of Peru and the Amazon and its tributaries. This animal is remarkable in that it resembles a mammal found in the Ganges, and because it is common to waters located a long distance from the sea.

Initiative (*ĭn-ĭsh'ĭ-ā-tĭv*). See *Referendum*.

Injection (*ĭn-jĕk'shŭn*), in medicine, introduction of medicaments into the body either hypodermically, under the skin by means of a needle, by the same means into muscles or veins, or into cavities of the body by means of a syringe.

Injunction (*ĭn-jŭnge'shŭn*), in law, an order issued by a court to restrain one or more persons or corporations from doing some act which they threaten to commit, or to continue the prosecution of some act which is already in progress. An injunction is likewise issued to restore certain rights to a plaintiff. The Romans originated the injunction, but their process, which was somewhat different, was known as an *interdict*. Now these writs are designated as *preventive*, when they are issued to restrain, and *mandatory*, when they operate to restore rights. A *temporary* or *preliminary* injunction is issued to restrain only until the defendant may answer, after which, if good cause is shown, it may be made *perpetual*. Those who disobey an injunction are guilty of contempt of court and may be fined or imprisoned. The term *government by injunction* originated from the employment of the injunctions in restraining interested parties from interfering in labor troubles. See also *Labor Injunctions*.

Ink (*ĭngk*), a fluid used for writing, printing, marking and copying. Writing inks consist of liquids containing colored material either in solution or colloidal suspension, of a viscosity low enough to flow on a pen and create a fine line. Common black inks consist of a salt of iron and tannin, with a suspending agent such as gum arabic. When a solution of a ferrous salt is used with the gallo-tannic acid of nut galls, it oxidizes on exposure to air and becomes jet black. Black ink contains iron tannate; blue-black ink ferrous gallo-tannate. Blue inks may be solutions of dyes, such as methylene blue, or suspensions of Prussian blue. Inks of other colors are usually solutions of dyestuffs or suspensions of pigments.

Copying inks are similar to writings inks in composition, but in addition contain small amounts of glycerin or sugar which permit them to transfer on wetting. Crystal violet, a purple dyestuff, is usually used for a copying ink which transfers to gelatin from the original and gives several copies by impression.

Sympathetic or cryptographic inks are solutions of cobalt chloride, citric acid, lemon juice, etc., which are not visible when written, but become legible after heating. Certain solutions of salts after exposure to vapors or liquids develop the original markings and become visible. Other colorless materials which fluoresce under exposure to ultra-violet light may be used to produce invisible writing.

Printing inks are varnishes which contain pigments. The varnish base may consist of boiled linseed oil with various natural or synthetic resins. Into this base is ground the pigment used. The varnish base may also have incorporated into it waxes, pitch, fats, and accelerators for oxidation or "drying." In printing it is desirable to have the work dry rapidly, and among the accelerators used for this purpose are manganese oleate. Solvents, or water emulsions, may be used in thinning printing ink. See also *India Ink*.

Inkberry (*ĭnk'bĕr-ĭ*), or WINTERBERRY, evergreen shrub belonging to the holly family. It grows from 2 to 4 ft. high in sandy regions along the east coast of North America. It has shiny leaves and small black berries from which its name is derived.

Inman (*ĭn'mən*), HENRY, portrait and landscape painter, born in Utica, N.Y., Oct. 28, 1801; died in New York City, Jan. 17, 1846. He entered West Point Acad., but soon after became interested in the study of art under John Wesley Jarvis, and in 1822 established a studio as a portrait painter. In 1832 he went to Philadelphia and in 1844 visited England, where he painted portraits of Macaulay, Chalmers, and Wordsworth. His productions comprise numerous landscape and historical subjects and excellent portraits of American statesmen, among them Martin Van Buren, William H. Seward, DeWitt Clinton, and Chief Justice Nelson. His best pictures include: "Rip Van Winkle Awakening," "An October Afternoon," "Lake of the Dismal Swamp," and "Boyhood of Washington."

Inness (*ĭn'nĭs*), GEORGE, landscape painter, born in Newburgh, N.Y., May 1, 1825; died at Bridge of Allen, Scotland, Aug. 3, 1894. He began landscape painting at the age of 21, visited and studied in Florence and Rome for some time, and returned to New York City in 1868. He resided in Italy from 1871 to 1875 and spent much of his later time in Europe. A memorial exhibition of 240 pictures painted by him sold at auction after his death for $108,670. Inness ranks high among American landscape painters. His productions are known for their fine coloring and natural expression. Many of his paintings inspire a feeling of moral depth. His best works include: "Summer Sunshine and Shadow," "Rome From the Tiber," and "The Edge of the Forest."

Innocent (*ĭn'nō-sənt*), the name of 13 Popes, who reigned between 402 and 1724. Those not specially treated reigned as follows: Innocent II, 1130 to 1143; Innocent IV, 1243 to 1254; Innocent V, from Jan. 20 to June 2, 1276; Innocent VI, 1352 to 1362; Innocent VII, 1404 to 1406; Innocent VIII, 1484 to 1492; Innocent IX, from

Oct. 29 to Dec. 30, 1591; Innocent X, 1664 to 1655; Innocent XII, 1691 to 1700; and Innocent XIII, 1721 to 1724. See *Pope*.

Innocent I, Pope of Rome, born in Albano; died July 28, 417, succeeded as pontiff in 402. During his reign Rome was besieged by Alaric, and when the sack occurred he was on a mission to Ravenna. His rule is noted for its energy and the success with which the influence of the church became extended. The enforcement of the marriage prohibition among the clergy occurred during his reign. He is one of the most distinguished saints of the Catholics, St. Innocent's Day occurring on July 28.

Innocent III, LOTARIO DE'CONTI, Pope from 1198 to 1216, born at Anagni in 1161; died in Perugia, July 16, 1216. He studied in Paris, Bologna, and Rome, where he became a cardinal, and at the age of 37 was elected the successor of Pope Celestine III. His rule was the most successful of the Popes that bore his name, and he stands high among the entire list of Popes. Since he believed that the successors of St. Peter were given power over the world as well as the church, it was his ambition to secure ecclesiastical dominion over all countries and sovereigns. The two orders of monks, the Franciscans and the Dominicans, were confirmed by him. He brought the powerful countries of Europe under his dictation, and the characteristic confusion in the political governments of his time made it possible to carry forward papal supremacy.

Pope Innocent III looked upon heresy as rebellion and regarded every offense against religion as a crime against society, making it the duty of every potentate to treat them likewise. His crusade against the Albigenses was intended to suppress opposing tendencies and practices. In 1215 the fourth Lateran council was held under his direction. This council established transubstantiation and auricular confession as dogmas of the Catholic Church. Besides many letters and sermons, he wrote a treatise entitled "On the Misery of the Condition of Man."

INNOCENT III

From a 13th century mosaic

Innocent XI, BENEDETTO ODESCALCHI, Pope from 1676 to 1689, born in Como, Italy, May 16, 1611; died Aug. 12, 1689. He studied law at Rome and Naples, and secured a liberal education. Innocent X made him cardinal in 1647, whose successor he became against the opposition of France. It was his aim to raise the clergy, as well as the laity, to a high moral standard of living, but his rule was opposed by Louis XIV. The latter seized Avignon, a papal territory, in consequence of a notice served by the Pope that he would retain the revenues derived where bishoprics were vacant. Later Louis XIV sent a fleet to threaten the papal states, but the Pope remained firm and the difficulty was not settled until his successor, Alexander VIII, ascended to the papal office.

Innocents' Day (*ĭn'ô-sẹnts dā*), a day set apart to commemorate the massacre of the children at Bethlehem, who are called the Holy Innocents and considered the earliest martyrs in the Christian cause. It is sometimes called Childermas and Feast of Holy Innocents, and is celebrated on Dec. 28 by the Roman Catholic and Anglican Churches. The Greek Church observes this day on Dec. 29.

Innsbruck (*ĭns'brōōk*), a city in Austria, capital of Tyrol, situated on the Inn River, 1,875 ft. above sea level. Near it are ranges of mountains from 7,500 to 8,600 ft. high. It is well connected by several railroad lines. The manufactures include silks, machinery, woolen and cotton goods, ribbons, and gloves. It has considerable trade in merchandise, live stock, and fruits. Its many beautiful buildings include a university founded in 1677, the Franciscan Church, containing an elaborate monument to Maximilian I, and a number of monasteries. Population, *ca.* 60,000.

Inns of Chancery (*ĭnz ŏv chăn'sĕr-ĭ*), the name of certain buildings in London, England. They were erected as places of residence and study for law students, and formerly were subordinate to the Inns of Courts. Several are still maintained as societies, but now have no public function, and are occupied mainly by solicitors. The principal buildings of this class at present are

the well-known Clifford's Inn and Furnivall's.

Inns of Courts (*ĭnz ŏv kōrts*), the four sets of buildings in London, England, that belong to the legal societies in which is vested the exclusive right of admitting persons to practice at the bar. These four buildings are known as Lincoln's Inn, the Inner Temple, Gray's Inn, and the Middle Temple, and they belong to the four legal societies of the same name. They had their origin about the end of the 13th century, and as early as the Middle Ages became famous as schools of law. The members consist of students, barristers, and benchers. Each inn is self-governing. It has the right to admit to the bar, disbar from practice, and reject a candidate without stating its reasons for refusal. One of the benchers is elected annually as treasurer, and this election qualifies him to be the presiding or chief officer. The term *barrister* is applied to all those members who are at least 21 years of age and who were called to the bar by the benchers of the inn where they were students.

Inoculation (*ĭn-ŏk-ū-lā'shŭn*), the art of communicating the virus of a particular disease to the system through the skin, or otherwise. Its purpose is to produce a mild form of some contagion and thereby protect the human body against contracting a highly dangerous form of the disease. Emanuel Timoni, a Greek physician, wrote a letter from Constantinople in 1713 favorable to inoculation, but it was not firmly established as a safeguard against smallpox until 1798, when it was introduced by Dr. Jenner. It is used in the prevention of such diseases as rabies and diphtheria. A mild form of the disease is experienced by the person artificially inoculated and this protects him against the contagion, but the disease in a dangerous form may be communicated to others.

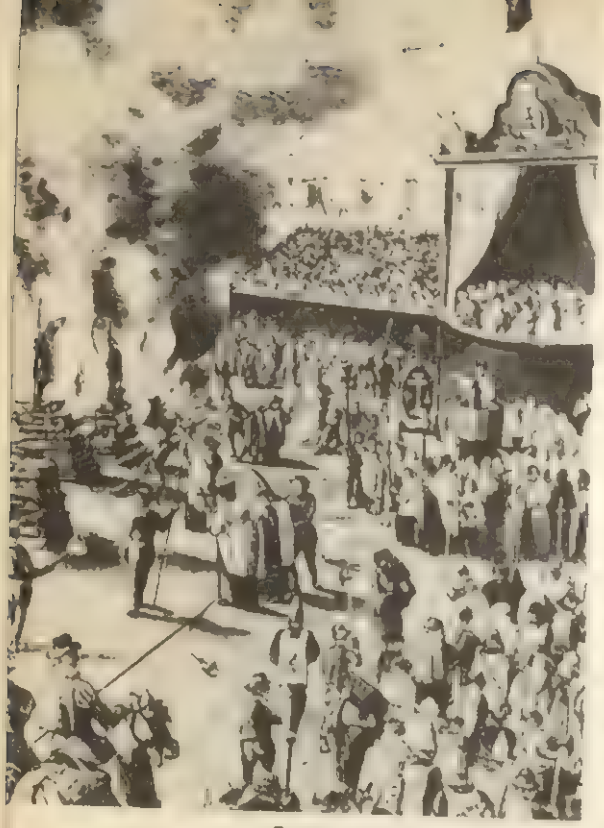
Inönü (*ĭ-nû-nü'*), ISMET, soldier, former president of Turkey, born in Smyrna in 1884. He was educated as a soldier and fought against insurgent elements in the multinational Ottoman empire and against Russia in World War I. He joined Kemal Pasha (*q.v.*) and was important in bringing about the new Turkish nation after his country's defeat in World War I. He gained victories over the Greeks, especially in the battles of Inönü in 1921. He then took part in the government as premier (1923-24 and 1925-37) and as president (1938-50), succeeding Kemal Pasha in the latter post. After losing the office, he remained active as leader of the opposition. He became premier again in November 1961.

Inquisition (*ĭn-kwĭ-zĭsh'ŭn*), a court or tribunal established by the sanction of the Roman Catholic Church in various countries for the purpose of examining and punishing heretics. Its purpose was to inquire (therefore the name, Inquisition) into heresies (*q.v.*), to punish confessed heretics and, if possible, to convince them of their mistake and so bring them back to God's grace.

Long before the formal inauguration of the Inquisition, heretics had been tried and punished with ecclesiastical, but also with worldly penalties. This system had begun under the Roman emperor, Justinian, in the 6th century and, immediately before the formal institution of the Inquisition, the Waldenses, the Albigenses, and the Cathari in southern France had been persecuted by the methods of the later Inquisition. St. Dominic (1170-1221) suggested the institution of a tribunal to deal with heretics, but it was not actually founded until the pontificate of Gregory IX. A synod at Toulouse resolved upon it in 1229 and it was formally established in 1233. The plan instituted carried with it the appointment of a priest and several laymen in every parish for the purpose of bringing heretics before the bishops. Soon after, the power of trial was delegated to the Dominicans, and the tribunal became known as the Holy Office or the Holy Inquisition. The Inquisition inflicted both ecclesiastical punishments, *e.g.*, excommunication, and worldly punishments, *e.g.*, public demonstrations of guilt in the forms of whippings, imprisonment in the stocks or, in some extreme cases, immurement, hanging or burning alive. The accusations about torture, however, are true only to the same degree as torture was generally used in the same periods in worldly trials. The Inquisition was never more cruel than its times.

In the 13th century, the century of its official beginnings, there were already many popular revolts against the practices of the Inquisition, especially in France, where it vanished almost completely, only to return, however, in the 16th century. In Italy, the 13th century saw a strong growth of the Inquisition, but here it vanished, too, until the Reformation gave a new impetus to the revival of inquisitory practices. The Inquisition never grew strong either in England or in Germany. When Conrad of Marburg made an attempt, in the 13th century, to establish it in Germany, he was assassinated, and it never gained a firm foothold there. It reached America only in the 16th century, being introduced into Mexico and Peru in 1571.

The country most commonly associated with the Inquisition is Spain. In 1481, it was established at Seville under formal sanction of Ferdinand and Isabella. Two Dominicans were made the first judges. Later it extended to other cities, where it was popular among the clergy and lower orders, but was opposed by the middle classes and the nobles. Fully 2,000 persons were burned alive by the Inquisition in Spain during its first two years. These burnings were called *autos da fé*. The main objects of the Inquisition in Spain were large numbers of Mohammedans and Jews, who, after the expulsion of the Moors from Spain,



Courtesy Bettmann Archive, N. Y.

AN AUTO DA FÉ AT THE TIME OF THE INQUISITION

professed Christianity for social and business reasons (see *Marranos*). Its principal interest, however, was only to detect false Christians, not to harass true Jews or true Mohammedans. See also *Torquemada, Thomas de.*

Some of the Popes of these centuries, including Sixtus IV and Clement VIII, protested against the brutality of Spanish methods and did much to alleviate the sentences of the tribunals. The inquisitors, mostly members of the Dominican order, exerted great political power in Spain at certain times because there the tribunal, although connected with the Church, was also regarded as an institution of the state.

The Inquisition was introduced in The Netherlands under Charles V (1519-56) and many persons were burned, but the tortured were usually political offenders as well as alleged religious heretics. The Inquisition was one of the factors which drove The Netherlands to their revolt against Spain. Finally, Napoleon abolished the Inquisition in Spain in 1808. Gradually, in the 18th and 19th centuries, it vanished everywhere and its function was taken over by the Sacred Congregation of the Holy Office, which, by different methods, tries to regain heretics.

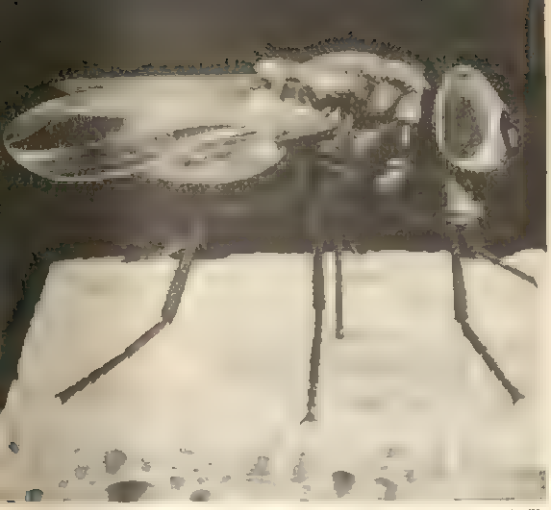
The Inquisition was neither created nor designed to persecute non-Catholics and to force upon them the Catholic belief. On the contrary, it was founded as an educational institution for leading heretics back to the doctrines of the Church. At the same time, it should not be forgotten that the harshest tortures against heretics were recommended by Calvin and other Protestant reformers and that these extreme punishments were executed by Protestants in Europe as well as, still later, in the American colonies.

Insane Asylum (*ĭn-sān' ă-sī'lŭm*), an institution established for the care and treatment of the mentally sick. In an early period of the Christian era, the monasteries were the retreats of those who suffered mental disturbances, and out of these grew the bedlams, or bethlehems, formerly common to England. Until more recent times, insane persons were greatly neglected. In the Middle Ages they were imprisoned, tormented, and even executed as criminals or as bewitched persons. However, asylums for the insane are strictly modern institutions, and they may be said to date from the early part of the 19th century. They are maintained chiefly as institutions belonging to the state or province, and are open to all who are adjudged insane after due examination by a competent committee or commission. See *Psychiatry.*

Insanity (*ĭn-săn'ĭ-tĭ*), a general term applied to disorders of the intellect, or unsoundness of the mind. See *Psychiatry.*

Insect (*ĭn'sĕct*), a member of the largest class in the Phylum Arthropoda of the animal kingdom. The members of this class are tracheate arthropods (obtaining oxygen by means of small tubes that penetrate throughout the body) and are characterized by having the body divided into three regions (head, thorax, and abdomen), a single pair of antennae on the head, three pairs of thoracic legs, and usually one or two pairs of wings. The abdomen in the adults is devoid of ambulatory appendages. The class *Insecta* is divided into two subclasses as follows: *Apterygota* (wingless insects) and *Pterygota* (largely winged insects). The subclass *Apterygota* is further divided into four orders: *Protura, Thysanura, Aptera,* and *Collembola.* The subclass *Pterygota* is divided into 29 orders, some of the more common being: the *Orthoptera* or grasshoppers and locusts; *Dermaptera* or earwigs; *Isoptera* or termites; *Anoplura* or lice; *Odonata* or damsel and dragon flies; *Lepidoptera* or butterflies and moths; *Coleoptera* or beetles; *Hymenoptera* or bees and wasps; *Diptera* or flies, gnats, and mosquitoes; *Siphonaptera* or fleas and chigoes.

Other arthropods that are closely related to the insects are included in the class *Arachnida* or scorpions, spiders, mites and ticks; the *Crustacea* or lobsters, crabs, and barnacles are less closely related. Insects far outnumber all other animals and it is estimated that there are about 800,000 species described thus far and that eventually there may be as many as 10,000,000 species known.



Courtesy American Museum of Natural History, N. Y.

MODEL OF A COMMON HOUSE FLY

They occur everywhere except in the polar regions and are localized and sparsely represented in marine habitats.

Among the living insects the greatest size is found in individuals of the orders *Coleoptera* (120-150 mm. in length), *Orthoptera* (260 mm. in length), *Hemiptera* (115 mm. in length), and *Lepidoptera* (280 mm. in length). The smallest insects occur in the *Coleoptera* (.25 mm. in length) and in some of the egg-parasites belonging to the order *Hymenoptera* which are even more minute. Some insects are smaller than the largest *protozoa* (*q.v.*) and others are larger than the smallest vertebrata (*q.v.*).

Insect development or metamorphosis is exceedingly diversified and complex. The life cycle begins with fertilization, the fusion of the sperm and egg into a single cell, and ends with a body composed of millions of cells, highly organized into a complex, living machine. Three types of reproduction are known among the insects: *oviparous*, the type in which the parent stores up food for the young inside the egg so that after the formation of the egg the parent nourishes it no further; *viviparous*, the condition in which during embryonic development a definite connection between parent and young is maintained and active young are born; *ovoviviparous*, an intermediate condition in which the eggs are retained until after they have hatched and active young then emerge from the parent.

All changes that take place between birth and maturity are called metamorphoses. The orders of insects are divided into three groups based on the types of metamorphosis. *Wingless insects* that upon hatching from the egg look so much like the parents that anyone would know they belonged to the same kind of insect are collectively called *Ametabola* (which means without change) or primitive. Their growth from young to adult is accompanied by no greater changes in appearance than those that take place from infancy to manhood. To this group belong the proturids, silverfish, campodeids and springtails. *Winged insects* never have visible wings upon emergence from the egg and the young, upon hatching, never completely resemble the adult. All winged insects, therefore, undergo metamorphosis during their development.

If the young are very similar to the adult except for the absence of wings, which after a time appear as wing pads, and if they develop gradually to resemble the parent, they are said to undergo gradual or simple metamorphosis and belong to the group *Heterometabola*. The young of these insects are called nymphs. The locusts, grasshoppers, cockroaches, earwigs, termites, lice, damsel flies, dragonflies, and bugs belong properly in this group. If the young are very different from the adult, in fact so different that without previous information they would not be suspected of being closely related animals, much less successive stages of the same individual, they are said to undergo complete or complex metamorphosis and belong to the group *Holometabola*. These insects pass through three stages of development: the larval, or growth, stage; the pupal, or transformation, stage; and the adult stage. The largest orders of insects properly belong to this group; *e.g.*, the beetles, butterflies, wasps, bees, flies, and fleas.

The vast majority of insects are beneficial, or at least not harmful, but a small percentage are serious pests in that they feed on plants and animals or their products necessary to man. To offset the injurious insects man has developed various insecticides with which to kill them. In addition, there are countless numbers of insects, chiefly wasps and flies, that are parasitic and others that are predaceous on both adults and larvae of these economic pests. The products of some insects are used by man; bees provide both honey and wax, the silkworm furnishes silk, and the lac scales provide lac for use in varnishes. Bees and flies are necessary in the pollination of many of man's food plants and other insects such as termites, fly pupae, adult grasshoppers, and beetle larvae are eaten by man, among primitive tribes in the South Seas and South America, and often furnish an important part of his diet, since they possess a high protein content. Many insects serve as food for our game birds and animals.

The most serious pests are those that attack man and his animals directly, causing injury both by their bites and because they are carriers of disease-producing organisms. Mosquitoes transmit malaria, dengue, yellow fever, filariasis and other diseases; fleas transmit plague, tularemia and typhus fever; lice transmit typhus fever. Other insects, such as the housefly, carry disease-producing organisms on their feet and body and transfer them to our food. The larvae of certain flies burrow

into the bodies of animals, including man, causing pain and injuring hides. Many insects carry plant diseases, such as curly top of sugar beets, and are thereby responsible for much damage to food and ornamental plants.

Numerous species are common household pests, some do damage to food, clothing and fabric furnishings, others attack the framework of the house or the wood furnishings, and others are pests just because of their undesirable presence. Termites and powder post beetles often make houses or portions of houses uninhabitable through their borings in the framework; tobacco beetles, clothes moths, and carpet beetles damage upholstered furniture and clothing; silverfish damage papers and books; larder beetles and hide beetles damage furs and carpets and meats; granary and rice weevils, mealworms and flour beetles attack granary products; cockroaches eat many food products and are a nuisance because of their scavenging activities; ants crawl about the house and frequently get into foods, especially those that are sweet; ladybird beetles, elm leaf beetles and other insects often get into homes inadvertently and are undesirable only because of their presence.

Some of the insects that are injurious to food crops and ornamental plants are: the Hessian fly on wheat, barley and rye; Colorado potato beetle on potatoes; chinch bug on wheat; cotton boll weevil on cotton; Japanese beetle and white-fringed weevil on numerous plants; gypsy and brown-tail moths on shade, fruit and woodland trees; red and black scale on citrus trees.

In insects an amazing diversity of adaptations is to be found. A well-developed social system is present among many of the wasps, bees, ants and termites, in which a caste system prevails; some individuals are used only in reproduction, some only as workers, and others as soldiers. Many insects have light-producing organs such as in the fireflies, glowworms and click beetles. Some have sound-producing organs (crickets, katydids) that produce sound audible to man. Many morphological adaptations are present that permit the insect to live under many environmental situations: legs are adapted for jumping, running, clinging, spinning and swimming; antennae are modified so as to increase sensory surfaces and are often filiform, setaceous, pectinate, serrate, clavate, lamellate, plumose, etc. Many insects are cryptically colored so as to closely resemble the leaves, twigs, bark or flowers on which they live. Others resemble closely organisms in different groups, possibly for protection, and are thus said to be mimics. For instance, certain beetles resemble wasps. The mouth-parts vary in form to a greater degree than almost any other organ, the variation being correlated with the method of feeding and other uses to which they may be subjected. They may be biting, piercing, sucking, rasping, lapping, or may be greatly reduced and nonfunctional.

Insect pests are chemically controlled by the application of insecticides such as Paris green, sodium fluoride, lead arsenate, nicotine, lime-sulfur, pyrethrum, rotenone, oil emulsions, DDT, hydrocyanic acid gas, carbon bisulfide and paradichlorobenzine. They can be controlled physically or mechanically by hand destruction, swatting, etc.; by exclusion, screening and tree-banding; by traps; by artificial cooling and superheating; by flooding, draining, and by the use of electricity. Cultural control can be accomplished by crop rotation, tilling of the soil, pruning and thinning, use of resistant varieties and by fertilizing and stimulating vigorous growth. They can be biologically controlled by protection of insectivorous birds and animals, introduction and artificial increase of parasites and predators, and the spread and increase of fungus, bacterial and protozoal diseases of insects. Legal control is maintained by quarantine and inspection laws.

Insecticide (*in-sĕk'tĭ-sīd*), a chemical substance used to destroy insects. Insecticides are prepared in the form of sprays, dusts, pastes, or fumigants. They are frequently mixtures of insecticidal materials in oil, water, or other liquids, or in powders with other inert substances. Contact insecticides, which destroy insects by corrosion of their bodies, include kerosene, soap, nicotine, lime-sulfur, pyrethrum, and rotenone. Bait insecticides, which destroy by being eaten, are usually arsenicals, fluosilicates, and fluorides. Nerve poisoning, causing death, is accomplished by DDT. The fumigants, which destroy insects by entering the breathing tubes, include carbonsulfide, hydrocyanic acid, and para-dichlorobenzene vapor.

PARTIAL LIST OF INSECTICIDES

Insect	*Insecticide*
Ants	Isobornyl, thiocyanoacetate, thallium sulfate
Aphis	Nicotine, soap
Bedbugs	Kerosene and phenol, rotenone, pyrethrum
Beetles	Barium fluosilicate
Boll weevils	Calcium or lead arsenates, hexachlorocyclohexane
Codling moths	Beta-naphthol
Crickets	Barium fluosilicate
Fleas	Rotenone, derris
Flies	Paradichlorobenzene, pyrethrum, DDT, isobornyl thiocyanoacetate
Japanese beetles	Carbon disulphide, dichloroethyl ether, DDT
Leaf hopper	Oil emulsions
Lice	DDT, kerosene
Locusts	Sodium arsenite, gammexane
Mealy bug	Thiocyanates
Mites	Derris, selenium
Mosquitoes	Oil sprays, DDT, isobornyl thiocyanoacetate
Moths	Camphor, naphthalene, paradichlorobenzene

Peach-tree borer	Paradichlorobenzene, ethylene dichloride
Potato bugs	Paris green, Bordeaux mixture
Red spiders	Selenium
Roaches	Sodium fluoride, phosphorus paste
Scale	Manganese arsenate
Termites	Orthodichlorobenzene, arsenic solutions
Wood ticks	Powdered sulfur, nicotine sulfate

Certain insecticides, such as rotenone and DDT, are effective against many insects, when prepared in the proper formulation. Most insecticides are highly poisonous, or toxic, even if the degree of toxicity is small, to human beings and animals. All commercial insecticides should be used strictly according to the instructions accompanying them.

New insecticides or combinations of known insecticides are continuously being developed commercially. They are tested according to an official standard prepared by the National Association of Insecticide and Disinfectant Manufacturers. The official test insecticide consists of a five per cent solution of 20:1 pyrethrum extract (20 pounds of pyrethrum flowers extracted in one gallon of solvent). The percentage of flies killed in 24 hours by the new insecticide is compared to the effectiveness of the official test standard, and the result determines the rating of the new insecticide.

Bordeaux mixture is prepared by mixing six pounds of copper sulfate (blue vitriol) with four pounds of lime and 40 gallons of water.

A preparation used chiefly for aphis and leaf hoppers consists of one pound of hard soap dissolved in a gallon of hot water, to which a gallon of kerosene is added.

Insectivora (*ĭn-sĕk-tĭv'ô-rà*), an order of placental mammals, including about 250 species, none of which is large in size. They are so named because they subsist largely on insects, although many are not exclusively insectivorous. Nearly all of the animals belonging to this order are timid and nocturnal in their habits, and they serve the useful purpose in nature of counteracting an undue increase of worms and insects. The molar teeth are fitted to break the coverings of insects, the legs are short, and most species step squarely on the soles of their feet. This order of mammals includes the mole, hedgehog, and shrew.

Insemination (*in-sĕm'in-ā'shŏn*), the introduction of sperm from one individual (male) into another individual (female).

Insessores (*ĭn-sĕs-sō'rēz*), a name applied by many writers to a large order of birds, which includes the perchers. The order embraces all those that live habitually among trees, excluding only the climbing birds and the birds of prey. The feet are adapted to walking and perching. The order of insessores includes all the more noted and beautiful birds of song.

Insignia (*ĭn-sĭg'nĭ-à*), Latin meaning signs, a term used to denote symbols of dignity or rank, especially in the Catholic Church, orders, lodges, political parties, etc., and in all armed forces. In the latter case insignia distinguish the rank, corps, regiment, division, etc., of the wearer.

Insolation (*ĭn-sō-lā'shŭn*), in medicine, exposure of the human body to sun rays; more especially, a possible result of this exposure: sunstroke.

Insolvency (*ĭn-sŏl'vĕn-sy*), in commerce, the business or accountancy condition of a person or a firm considered unable to pay its debts; distinguished from bankruptcy (*q.v.*), which is a legal condition, in which the insolvent person or firm has entered court to be adjudged bankrupt.

Insomnia (*ĭn-sŏm'nĭ-à*), or SLEEPLESSNESS, a condition due to some emotional or physical disorder, such as exhaustion, worry, or excitement. It is treated by hot baths, massage, or sedatives.

Inspiration (*ĭn-spĭ-rā'shŭn*), in theology, the influence exercised upon the human mind by the Holy Spirit, through the influence of which the understanding is widened and all the mental faculties are quickened. It is in this sense that the term inspiration is used in regard to the Scriptures, which are held to be the writings of men who were inspired by the divine mind to reveal and communicate to man what is essential for his salvation. The degree and extent as well as the mode of inspiration are subjects of dispute.

Installment Business (*ĭn-stȧl'mĕnt*), a plan of selling durable goods, such as automobiles, refrigerators, radios, washing machines, as well as jewelry and general commodities, on a deferred payment basis. At the signing of the contract the consumer is required to make a cash down payment of a certain percentage of the total sale, with the balance payable at regular intervals until liquidated. This business thrived during the recovery years from 1933 on, until World War II made restrictions necessary. Beginning in 1946, installment-credit controls were gradually relaxed as commodities became increasingly available and the need to stimulate retail sales increased. In March 1959 outstanding installment credit for consumer goods (including automobiles) amounted to *ca.* $23,000,000,000.

Instinct (*ĭn'stĭnkt*), a natural impulse by which animals are directed without reasoning toward the actions that are essential to their existence, preservation, and development. The theories advanced regarding animal instinct include at least three. These are that each species is endowed by the Creator with various faculties and impulses; that the instincts have resulted from consecutive repetition, and these have been transmitted by inheritance to subsequent generations; and that they arise from unknown causes, though the more complex are modified through natural selection and the simpler actions of an instinctive nature. In some animal forms the instincts are

developed to a high state of perfection, as is the cases in bees, which are thereby enabled to construct cells. Darwin thought that animals in the past, as now, have varied in mental qualities, that those variations are inherited, and that by natural selection the instincts of many animals have been developed to a higher degree. See also *Animal Intelligence*.

Institute (*in'stĭ-tūt*), a scientific body or society established under certain rules for the promotion of some particular object, as a literary or philosophical association. The term is applied in France to the principal society of its kind in the world, which was formed in 1795 by the union of the four principal royal academies—the Académie des Belles-Lettres et Inscription, Académie Française, Académie Royale des Sciences, and Académie Royale d'Architecture. Since 1848 it has been known officially as the *Institut National de France,* but English writers usually term it the Institute of France. At present this great institution embraces five distinct divisions, each of which represents a particular field of knowledge. The divisions are Académie Française, Académie des Beaux-Arts, Académie des Sciences, Académie des Inscriptions et Belles-Lettres, and Académie des Sciences Morales et Politiques. In each division is a distinct organization, but all are closely affiliated, and the control of the finances of each academy is under a distinct board. Membership is for life.

Institute for Advanced Study, THE, at Princeton, N.J., founded (1930) by Louis Bamberger and Mrs. Felix Fuld for the purpose of giving young men and women an opportunity to pursue post-doctorate research in the fields of mathematics, economics and politics, and humanistic studies. The faculty is small, but a larger group of temporary members are invited to work with the faculty. They are chosen because of their ability in research and creative scholarship and the relationship which their projects have to the work being pursued at the Institute. There is no specified program of research. There are no examinations and no degrees. Both faculty and members are given offices, books and complete leisure in which to work. Most of the activities of the Institute are carried on in Fuld Hall, which is located on the Olden Farm, the site of the Battle of Princeton.

Institute of International Law, an organization formed at Ghent, Belgium, in 1873. The Institute had originated two years before as a private organization to keep records of international law. When the Institute was formally established in 1873, it began publishing its *International Law Review* and later an *Annual* containing reports and minutes of its meetings. The organization was responsible for the first International Arbitration Conference, held at The Hague in 1899, during which a codification of laws relating to warfare, to the submarine cable, etc., was worked out. In 1904 the Institute was awarded the Nobel Peace Prize for its work. Its activities in reforming and codifying international law gained wide recognition and gradually branches were organized in various countries, the American branch of the Institute having been founded in 1922.

Instrumental Music (*ĭn-strū-mĕn'tąl*), the music which is produced by instruments, as distinguished from singing or vocal music. Purely instrumental music was known in ancient Greece, and it is said that the flute was played publicly at the Pythian games. However, the art of arranging the parts of a composition for orchestra, which is known as *instrumentation* or *orchestration,* is of comparatively recent origin. Johann Sebastian Bach is properly regarded as the originator of modern instrumentation.

Courtesy Armstrong Cork Co.

CORK INSULATION

Insulation (*ĭn-sû-lā'shŭn*), a substance which is a nonconductor of electricity or a nonconductor of heat. Materials differ greatly in their ability to conduct electricity. Those which conduct it easily, such as the metals silver, copper, and aluminum, when compared with insulators such as glass, quartz, or amber, show a relative conductivity of 10^{22} times more than the insulators. Electrical insulation is measured in megohms (1,000,000 ohms). The thermal (heat) conductivity of the metals is very similar to their electrical conductivity. Insulating materials used to restrain the passage of both electricity and heat include: air, paper, pressboard, cotton, silk, wood, gutta-percha, glass, asbestos, and slate. Substances used mainly for electrical insulation are: hydrocarbons, amber, copal, beeswax, paraffin, shellac, rosin, asphalt, pitch, tar, laminated or

vulcanized or varnished paper, oiled textiles, soft or vulcanized rubber, porcelain, enamel, varnished asbestos, mica, nitrocellulose products, and phenolic resins. Materials used principally for heat insulation are: water, corrugated paper, wood fiber, grass, bark, cork, peat, wool, linen, asbestos, fiberglass, clay, and diatomite. The best nonconductor of heat is space containing nothing at all. For this reason, the vacuum bottle has double glass walls with the air removed from between them. Commercial building materials are frequently made porous. These include: fiberglass, rock wool (asbestos), Celotex, Sil-o-cel, and corkboard. The fur or wool of animals is an excellent insulator, depending partly for its insulating properties on the air spaces between the fibers.

Insulin (*ĭn'sū-lĭn*), the extract derived from a portion of the pancreas and now used successfully in treating patients who are affected by diabetes mellitus. The pancreas consists of two types of tissue—the granular masses that secrete the pancreatic juice, which reaches the intestine through the pancreatic duct, and groups of cells scattered throughout the gland, rich in a supply of blood, known as the islands of Langerhans, so-named from Dr. Langerhans, a German physician. It is now thought that diabetes is caused by a failure of these "islands" to function, that is, to fail to effect the oxidation of excess sugar in the blood.

Insulin was developed (1921) by J.J.R. MacLeod, Dr. F.G. Banting, and Dr. C.H. Best. More recently insulin has been used as a cure for other conditions as well, *e.g.*, excessive leanness. See also *Psychiatry*.

Insull (*ĭn'sŭl*), SAMUEL, financier, born in London, England, 1859; died in 1938. He came to America at the age of 22, and became Thomas Edison's secretary. By 1889, he had risen to the vice presidency of the Edison General Electric Co. He held a similar position in the General Electric Co. when it merged with the Edison Co. in 1892. He was president of various Illinois utility companies until 1932, when three of his firms went bankrupt, causing serious losses to many stockholders, mostly persons of limited means. He fled the country to avoid arrest, but, returning, he was tried (1934-35), and acquitted.

Insurance (*ĭn-shōōr'ăns*), a method whereby a person contracts to be paid indemnity for the amount of his property destroyed, as by fire, or whereby a fixed sum is paid to another person on the death of the insured. In the first case the amount paid is based on indemnity, *i.e.*, the loss sustained. In the second case it is based on a fixed sum agreed on beforehand. In any case of insurance the loss sustained to property or life must be due to an accidental happening, not to planned action.

Today there are in existence 567 types of insurance. These are divided into the following groups: (1) Insurance Against the "Acts of God and Man," (2) Indemnity Against Liability and Property Damage, (3) Life, (4) Accident, (5) Health, (6) Inland Marine, (7) Automobile, (8) Ocean Marine, (9) Aviation, (10) Fidelity Bonds, (11) Surety Bonds, (12) Plate Glass, and (13) Miscellaneous. Under each heading there are the various types of hazards for which liability may be assumed.

A number of terms are used in the insurance business, these being recognized both in law and contracts as more or less clearly implying certain parties or facts. Among them are the terms *underwriter* or *insurer*, meaning the party taking the risk. The *assured* or *insured* is the party who is promised compensation in case of loss. The *premium* is the amount paid for insurance, the *policy* is the written contract, the *risks* or *perils* constitute the events insured against, and the *insurable interest* is the interest, subject, or right to be protected.

MARINE INSURANCE. The oldest form of insurance, dating back, according to a contract, to 1437. Its origin was due to the realization that vessels at sea were exposed to losses over which the captain in charge had no control. These losses were the ones to be paid for by a policy. Someone conceived the idea that if each adventurer paid a certain sum for each voyage the total would be enough to pay the losses and at the same time reimburse the person who assumed the risk. Once the principle was recognized marine insurance was developed to take care of all forms of losses which were due to some damage to the insured property. These losses which occasioned the damage, were, from the beginning, set forth in the policy and today appear in the same language.

FIRE INSURANCE. The second form of insurance to be developed was fire insurance, meaning thereby insurance against loss sustained by an accidental fire. This originated in its modern form after the great fire of London in 1666. Nicholas Barbon, a physician, conceived the idea that if enough persons would purchase policies of insurance against loss by fire the joint sums would furnish a fund out of which the losses due to fire on the insured property might be paid. This principle proved to be a fact and the success of the early organizations led to the development of the business through an increasing number of companies. It is undoubtedly the most widespread form of insurance of any kind now practiced. In the beginning it covered only the value of the property, *i.e.*, the value of the building or the contents. There developed, however, later types known as *rent* insurance, *use* and *occupancy*, etc. These insured a person against loss sustained to his property which had been destroyed by fire, causing him deprivation of income which he

might have collected from the property. It may be said that these particular forms of insurance were developed to protect the owner against damage sustained to the property thus making it non-earning.

In time it became the business of the courts to define the kinds of fire losses which would be covered by the policy. Fires were defined as either "friendly" or "hostile" and these terms still hold true today. A friendly fire is one confined within its own proper place. A hostile fire is one that breaks out of that place and does damage to the surrounding property.

From the beginning fire insurance companies made a study of the causes which produced fires, *i.e.*, developed means of preventing them. It organized fire companies and developed the care of individual properties by making allowances in the insurance rate for the installation of fire pails and sprinklers. The damage sustained in putting out a fire, as by water from a hose, is part of the insurance loss as well as the direct loss by burning.

Automobile Insurance. The introduction of automobiles not only gave rise to the ordinary losses or damages which might be due to injury to a vehicle or to a person in the car but also to the legal liability which the owner of the car might be subject to. A person driving an automobile is immediately subject to the injuries and possibilities of loss which might arise from driving any vehicle. These are: (1) fire, (2) theft, (3) damage by collision, (4) bodily injury, and (5) legal liability. The principal protection needed in automobile insurance arises out of the legal liability primarily because the cost of an accident for which damage may be claimed may run into many thousands of dollars. In order for insurance to be effective it must make provision to cover all hazards to which an insured is exposed. He may not wish protection against all of them, but he must have the opportunity of securing this protection if he so desires.

Life Insurance. This type of insurance is a cooperative risk-sharing plan whereby large numbers of people can set aside a portion of their earnings to provide funds against the hazard of loss of income, either by death, disability, or retirement. Its exact origin is not known but it is believed that it grew out of marine insurance.

A life insurance policy is a written agreement between the company and the insured (the *policyholder*). The company promises to pay a specified sum of money, or its equivalent in monthly income, to the person or persons named in the policy (the *beneficiaries*) upon the policyholder's death, or to pay to the insured himself a certain sum of money, or income, under specified conditions. In return, the insured promises to pay regularly to the company a sum of money known as the *premium*.

The premium rate is based on the death rate among insured groups, the rate of interest earned on investments, and the company's operating expenses. Statistics based on the experience with thousands of insured persons are set forth in *mortality tables*. These show the probable number of deaths at each age in life (the *mortality rate*) and enable the companies to predict their probable future mortality experience. A portion of each premium is used to pay current death claims, a predetermined portion goes into the *reserve* fund to help meet future obligations to policyholders, and a small portion is used to defray the operating expense.

Life insurance is marketed in three forms:

Ordinary life insurance is issued in units of $1,000, and premiums are payable annually, semi-annually, quarterly, or monthly. A medical examination is usually one of the requirements in securing a policy. It can be used to meet practically every need for protection of human life values.

Industrial life insurance is designed for the lower-income families, and is issued in smaller amounts, usually less than $1,000. Premiums are collected weekly or monthly by the agent at the home of the insured. A medical examination is not required in most cases.

Group life insurance is issued under a master contract to a group of people, usually the employees of a business or industrial organization. The employees and employer usually share the cost of the protection, and the amount of insurance issued to each individual is usually the equivalent of one or two years' salary.

Whether Ordinary, Industrial, or Group, life insurance policies fall into three basic types: (1) *Whole or Straight Life* pays the face amount to the insured's family at the time of his death and premiums are payable as long as he lives. A variation is the limited-pay whole life plan, which provides the same protection as the straight life policy but premiums are payable only for a specified number of years, for instance, 20 or 30 years, or to age 65. (2) *Endowment* policies enable the insured to accumulate a certain amount of money, usually the amount of insurance (*face value*) of the policy, in a definite number of years. This money is payable to the insured when he reaches the end of the endowment period (*maturity date*). Should he die before that time, his beneficiary receives the insurance immediately. Both whole life and endowment policies contain cash and loan values which increase in amount throughout the life of each contract. These values are useful to the insured in time of emergency, or may be used by the insured himself as retirement income if the protection is no longer needed. (3) *Term insurance* provides temporary protec-

tion and is payable only if the death of the insured occurs within a specified term of years. The term of the policy is selected in advance by the insured and is usually one year, five, ten years, or longer. There are seldom any cash or loan values; however, if the term is particularly long there may be a cash value which disappears along with the protection at the end of the term period.

Most life insurance companies also write life *annuity* contracts. A life annuity provides a regular income monthly, quarterly, semiannually, or yearly for as long as the annuitant lives. Annuities may be either immediate or deferred, depending on whether the income is to start with the purchase of the contract or at some later specified time. Immediate annuities must necessarily be paid for in one lump sum, whereas deferred annuities may be paid for either in a lump sum or in a series of payments over a period of years.

The importance of life insurance in the U.S. is reflected in the following (1950) figures: number of life insurance policyholders in the U.S., about 80,000,000; total life insurance in force, about $220,000,000,000; average amount of insurance per family, countrywide, $6,000.

Health Insurance. Indemnity for loss of (occupational) time due to sickness. It usually provides for hospital, nursing, and surgical expenses, but not for medical treatment. *Hospitalization* provides indemnity for hospital charges and certain other expenses. The protection is usually limited to a specified amount per day for a stated number of days.

Casualty Insurance. The forms of insurance included under the term *casualty* consist of several different classes, each class practically a distinct body by itself. Casualty insurance came into existence as a result of the development of railroad travel. It originated in Great Britain for the sole purpose of taking care of injuries or accidental death to railroad passengers. However small or large the injury might be, protection was afforded, provided it was caused in an accidental manner during travel on a railroad. After a somewhat brief trial on railroads it was gradually extended to include accidental injuries to the insured persons however caused. This branch of the business is known as *personal accident*, and is written by casualty and life insurance companies.

There is no standard policy in personal accident insurance, but there are certain provisions which are known as standard provisions, and these are common to practically all policies of this particular type. A company is therefore free to change the other provisions, largely the benefit provisions, as it sees fit.

Inland Marine. A later growth of insurance is the form known as inland marine. It is practically marine insurance applied to damages incurred by property in motion but not to damages involving ocean hazards. It would insure, for example, the goods made by a manufacturer in Ohio in transit until it reaches the warehouse of a buyer in Massachusetts.

National Service Life Insurance. A system established in 1940 for granting life insurance to persons enrolled in active service. See *Veterans Administration, U.S.* See also *Expectation of Life; Vital Statistics.*

Integer (*ĭn'tē-jĕr*), a term in mathematics. See *Number.*

Integral Calculus (*ĭn'tē-grăl eăl'eū-lŭs*). See *Calculus.*

Intellect (*ĭn'tĕl-lĕkt*), the power or faculty of the human soul by which it knows. Ideas are communicated to us by the senses or by other means. Through the intellect the soul becomes able to perceive objects in their relations, upon which depends its power of judging, reasoning, and comprehending. It is distinguished from the other two powers of the soul; namely, the power to feel and the power to will.

Intelligence (*ĭn-tĕl'ĭ-jĕns*), in military terminology that branch of an army staff which is concerned with collecting information regarding the foe and his activities. Intelligence departments also disseminate war news of all sorts, both to the home front and to the enemy (propaganda). The U.S. in 1947 established a Central Intelligence Agency, which is charged with coordinating all intelligence activities of the Government.

Intelligence Tests, standardized mental tests as developed by Galton, Catell, Münsterberg, and Claparède during the 19th century. Results of these tests are measured in figures (*Intelligence Quotient* or *I.Q.*) which give the relationship between the chronological age and the mental age as shown in the test. After 1900, American scientists developed the theory of the intelligence test further, but the principle has remained the same.

Technical professions, the army and navy, etc., make use of intelligence tests for vocational guidance proposes and to aid in selecting those best qualified for specific tasks. Entrance into colleges and universities is sometimes dependent on intelligence tests in addition to ordinary scholastic achievements. However, only certain abilities can be measured by such testing and a picture of the total personality can never be attained by an intelligence test alone.

Inter-American Highway (*ĭn'tĕr ă-mĕr'ĭ-kăn*). See *Pan American Highway System.*

Interest (*ĭn'tĕr-ĕst*), an allowance or premium for the use or detention of money. The profit paid on borrowed money is called *interest*, the money on which interest is paid is termed the *principal*, and the interest and principal taken together constitute the *sum* or *amount*. Interest is either simple or compound. *Simple interest* is computed at a certain rate for the whole time on

the loan, and is generally employed only when money is borrowed for less than a year. *Compound interest* arises when the simple interest is not paid when due. To illustrate: $100 at six per cent for one year amounts to $106. For the second year, if the first year's interest is not collected, the principal is $106, the interest is $6.36, and the amount is $112.36. The rate of interest depends upon various conditions, *e.g.*, the amount of money in circulation, the demand for money, the amount offered for investment, and the nature of the security offered, or the personal liability of the borrower. The *legal rate* of interest is a rate allowed by law, and any excess charged is termed *usury*. In some states a rate higher than the legal rate may be provided by contract.

Interference (*ĭn-tĕr-fēr'ĕns*), the phenomenon occurring when two beams of light alternately reinforce and annul each other as a result of difference of path or speed. The effect was discovered by Thomas Young (1773-1829) and was used by him to demonstrate that light is propagated by a wave motion. The French physicist, Augustin Fresnel (1788-1827), invented two devices, a biprism and a double mirror, by means of which the wave length of light might be measured using the phenomenon of interference.

Interferometer (*ĭn-tĕr-fē-rŏm'ē-tĕr*), an optical apparatus for measuring distance by the effect of interference. The interferometer is an instrument of precision and distances of several inches may be measured with an accuracy of 1/100,000 of an inch. The interferometer invented by A.A. Michelson in 1882 uses a pair of highly polished mirrors mounted at right angles to combine the interfering light beams. The Fabry and Perot interferometer uses parallel mirrors.

Interlaken (*ĭn-tĕr-lä'kĕn*), a resort in Switzerland, on the Aar River, between Lakes Brienz and Thun. Founded *ca.* 1130, it is famous for its view of the Jungfrau (*q.v.*). Pop., *ca.* 3,000.

Intermezzo (*ĭn-tĕr-mĕd'zō*), a term for several types of musical compositions. Originally the term meant a comic interlude with music inserted between the acts of a drama; it was later used in serious opera (*q.v.*). An intermezzo may also be a short, slow movement joining two main movements of an instrumental work in a large form (*e.g.*, a sonata or symphony) or of a vocal composition; also, a short independent piano piece.

Intern (*ĭn'tûrn*), a physician resident in a hospital. Regulations concerning internships vary from state to state. Prescribed periods for internships depend on the requirements of the hospitals, medical schools, and boards of the specialized fields of medicine.

Internal-combustion Engine (*ĭn-tûr'nəl kŏm-bŭs'chŭn ĕn'jĭn*), an engine for obtaining mechanical power by the combustion of fuel within a cylinder fitted with a reciprocating piston. The two principal types of internal-combustion engine are the four-cycle gasoline engine invented by Nikolaus Otto (1832-91) and the diesel engine (*q.v.*) invented by Rudolph Diesel (1858-1913). The gasoline engine burns a mixture of gasoline vapor and air which is compressed by the piston; the electric spark at the gap of the spark plug ignites the mixture. The diesel engine uses no spark plug, but the fuel oil is injected into the cylinder after the air has been compressed by the piston and has been heated to a temperature above the ignition point of the oil. In 1954 there were in the U.S. 119 establishments, which employed 39,273 persons, in the production of internal-combustion engines, with a value added by manufacture of $371,199,000.

Internal Revenue (*rĕv'ē-nū*), tax income derived by the government from domestic sources apart from customs duties (*q.v.*). Since passage (1913) of the 16th Amendment to the Constitution, the major source of internal revenue for the U.S. has been the income tax (*q.v.*). Internal revenue collections in the fiscal year 1958 amounted to $79,978,476,000, which was $193,495,000 less than the 1957 record high in collections.

Of this amount, $38,568,559,000 was derived from individual income taxes; $20,533,316,000 from corporation income and profits taxes; *ca.* $8,644,385,000 from employment taxes (for old age and disability insurance, unemployment insurance, and railroad retirement); $2,946,461,000 from alcohol taxes; $1,734,021,000 from tobacco taxes; $6,133,786,000 from other excise taxes; $1,410,925,000 from estate and gift taxes; and $7,024,000 from other miscellaneous taxes.

Internal Secretion (*sē-krē'shŭn*), a general term for the organic substances formed within certain parts of the body and carried by the blood to other organs of the body. See *Hormones; Secretion*.

Internal Security Act (*sē-kū'rĭ-tĭ ăkt*). See *Civil Service; Communism*.

International (*ĭn-tĕr-năsh'ŭn-əl*), the name given to several workingmen's groups which have played varying roles in labor history. Earliest of these organizations was the International Workingmen's Association, a political entity embracing workers of all nations, known as the First International, the purpose of which was the protection and emancipation of the working classes. Karl Marx (*q.v.*) drafted the constitution for the first meeting in London, Sept. 28, 1864. The first international congress of 60 delegates meeting at Geneva in 1866 approved the eight-hour day and advanced a system of education. In 1867, at Lausanne, the English delegation, committed to trade unionism, withdrew from the organization when socialistic principles were introduced. The Brussels Congress of 1868 declared against war and

introduced the general strike as an anti-war weapon. It also advocated state ownership of mines, land and means of transport. By 1873, the organization had lost its European affiliates, and the American remnant was formally disbanded in 1876. In 1889, the Second International was formed, maintaining headquarters in Brussels, Amsterdam and London successively. Broken up by World War I, it was dissolved by a Congress at Hamburg in 1923; simultaneously a new organization, known as the *Labor and Socialist International* was established as its ideological successor. It is this organization which is now generally but inaccurately designated as the "Second International." The Labor and Socialist International was overshadowed by the Third (or Communist) International (Comintern) which grew out of attempts by left wing elements to establish a new international workers' association during World War I. The Comintern was disbanded in 1943. See also *Communism.*

Several revivals of the Socialist International have been attempted without success. However, in December 1947, an international conference, held in Antwerp, Belgium, established a permanent Committee for the International Socialist Conferences (Comisco), and in March 1951 the Socialist International was revived at a meeting in London, England.

The *"Internationale,"* with words by Eugène Pottier and music by Adolphe Degeyter, hymn of the international working-class movement, was first sung in 1871.

International Bank for Reconstruction and Development, an international banking institution proposed at the International Monetary and Financial Conference at Bretton Woods, N.H., July 1944. It came into existence concurrently with the International Monetary Fund (*q.v.*) on Dec. 27, 1945. As of Aug. 31, 1962, 78 countries were members of the Bank. According to its charter, all members of the Bank must also be members of the International Monetary Fund.

The principal purposes of the Bank are (1) to assist in the reconstruction and development of its member countries by facilitating the investment of capital for productive purposes, thereby promoting the long-range growth of international trade and the improvement of standards of living; (2) to promote private foreign investment by guarantees of and participations in loans and other investments made by private investors; and (3) when private capital is not available on reasonable terms, to make loans for productive purposes from its own resources or funds it borrows.

All powers of the Bank are vested in the board of governors, which is composed of one representative and an alternate of each member country. The board has delegated most of its authority to the executive directors, of whom there are 14: 5 appointed by the countries having the largest capital subscriptions, and 9 elected by the governors of the remaining member countries. Voting power of member countries is roughly proportionate to their capital subscriptions. The president is ex-officio chairman of the executive directors and, subject to their general direction, is responsible for conduct of the Bank's business.

The Bank may lend funds directly, either from its capital funds or from funds which it borrows in the investment markets. It may guarantee loans made by others, or it may participate in such loans. Loans may be made to member countries directly, or to any of their political subdivisions, or to private enterprises located in the territories of members. When the member government in whose territory the project is located is not itself the borrower, however, this member government, its central bank or some comparable agency acceptable to the Bank must guarantee the loan. The Bank does not make loans which are obtainable in the private market on reasonable terms. Through its system of supervision, the Bank makes certain that funds loaned are used only for authorized purposes with due attention to considerations of economy and efficiency.

The Bank's capital is derived from subscriptions by its member countries to shares of capital stock. A country's subscription is based approximately on its relative economic resources. As of Aug. 31, 1962, the Bank's subscribed capital totaled the equivalent of $20,548,100,000. The members and their subscriptions are as follows:

Country	*Amount*	*Country*	*Amount*
(As of Aug. 31, 1962—in millions of dollars)			
Afghanistan	30.0	Haiti	15.0
Argentina	373.3	Honduras	6.0
Australia	533.0	Iceland	15.0
Austria	100.0	India	800.0
Belgium	450.0	Indonesia	220.0
Bolivia	21.0	Iran	90.0
Brazil	373.3	Iraq	15.0
Burma	40.0	Ireland	60.0
Canada	750.0	Israel	33.3
Ceylon	60.0	Italy	360.0
Chile	93.3	Japan	666.0
China	750.0	Jordan	15.0
Colombia	93.3	Korea	25.0
Costa Rica	8.0	Laos	10.0
Cyprus	15.0	Lebanon	9.0
Denmark	173.3	Liberia	15.0
Dominican Rep.	8.0	Libya	20.0
Ecuador	12.8	Luxemburg	20.0
El Salvador	6.0	Malaya	50.0
Ethiopia	10.0	Mexico	173.3
Finland	76.0	Morocco	70.0
France	1,050.0	Nepal	10.0
Germany, West	1,050.0	Netherlands	550.0
Ghana	46.7	New Zealand	166.7
Great Britain	2,600.0	Nicaragua	6.0
Greece	50.0	Nigeria	66.7
Guatemala	8.0	Norway	133.3
		Pakistan	200.0

Country	Amount	Country	Amount
Panama	.4	Syrian Arab Rep.	20.0
Paraguay	6.0	Thailand	60.0
Peru	35.0	Togo	15.0
Philippines	100.0	Tunisia	30.0
Portugal	80.0	Turkey	115.0
Saudi Arabia	73.3	United Arab Rep.	106.6
Senegal	33.3	United States	6,350.0
Somalia	15.0	Uruguay	10.5
South Africa	200.0	Venezuela	140.0
Spain	200.0	Viet Nam	30.0
Sudan	20.0	Yugoslavia	106.7
Sweden	200.0		

The member countries have paid in 10 per cent of their subscribed capital; one per cent in gold or U.S. dollars, which is immediately available for lending purposes, and 9 per cent in the currencies of the various member countries, which is available for loans only with the consent of the country whose currency is concerned. The remaining 90 per cent of the capital can be called only when required to meet the Bank's obligations, created by borrowing or in guaranteeing loans. The Bank obtains additional funds for loans from the sale of its own bonds to private investors, from sales of securities out of its loan portfolio, and from income received in its operations.

The Bank also provides technical advice and assistance, such as special missions to examine the financial and technical feasibility of projects submitted for financing.

International Confederation of Free Trade Unions. See *Trade Union.*

International Court of Justice, the principal judicial organ of the United Nations (*q.v.*). It functions in accordance with the Statute of the Court, no two of whom may be nationals of the same state. The term of office is nine years and members are eligible for re-election. However, at the first election (1946), five judges were elected for three years and five others for six years. Since then elections have taken place every three years, with five judges being elected each time.

A list of the judges of the Court follows:

To serve until 1964. Jules Basdevant (France); Roberto Córdova (Mexico); José Gustavo Guerrero (El Salvador), died in 1958 and was succeeded by Ricardo J. Alfaro (Panama); Hersch Lauterpacht (U.K.), died in 1960 and was succeeded by Gerald Fitzmaurice (U.K.); Lucio Moreno Quintana (Argentina).

To serve until 1967. Abel Hamid Badawi (U.A.R.); V. K. Wellington Koo (China); Percy Spender (Australia); Jean Spiropoulos (Greece); Bohdan Winiarski (Poland).

To serve until 1970. J. L. Bustamente y Rivero (Peru); Philip C. Jessup (U.S.); Vladimir M. Koretsky (U.S.S.R.); Gaetano Morelli (Italy); Kotaro Tanaka (Japan).

All the members of the U.N. are *ipso facto* parties to the statute. The Court is open to other states on conditions laid down by the Security Council. Only states may be parties to a case before the court.

The General Assembly or the Security Council may request the court to give an advisory opinion on any legal question. Other organs of the U.N. and the specialized agencies, when authorized by the General Assembly, may also request advisory opinions of the court.

The jurisdiction of the court comprises those cases which states refer to it and matters provided for in the Charter of the U.N. or in treaties or conventions in force. The decision of the court has no binding force except between the parties to a case and in respect of that case. The judgment is final and without appeal. All members of the U.N. have agreed to accept the court's decisions. If one party to a case fails to accept a decision of the court, the other party may have recourse to the Security Council, which may decide what measures to take to give effect to the court's judgment.

The seat of the court is at The Hague, The Netherlands. The court elects its own president and vice president. The president and the registrar reside at the seat of the court. A quorum of nine judges constitutes the court. Questions before the court are decided by a majority of the judges present. In the event of equal votes, the president has a deciding vote.

International Date Line, a geographical term, a line drawn arbitrarily near the 180° meridian of longitude, in the Pacific Ocean. This line closely follows the 180° meridian of longitude from the South Pacific to the Bering Sea, whence it passes through Bering Strait. It designates the place where a navigator on a trans-Pacific voyage changes his date of reckoning time. The term and institution have come into general use by practice and not by international convention. That the 180° meridian has been chosen is based upon the fact that it is located exactly 12 solar hours from Greenwich. The fact that it is located near the middle of the Pacific Ocean, a great distance from populous countries, is another reason for choosing this locality.

The explanation for the need of a date line is founded on the fact that a person traveling west or east lengthens or shortens his day one hour for every 15° traveled, since he moves with the sun in traveling west and in the opposite direction from the sun in traveling east. In moving eastward, a traveler shortens each day four minutes for every terrestrial degree he travels, so that after passing entirely around the earth he will have gained one day. On the other hand,

a traveler who moves westward lengthens each day four minutes for every terrestrial degree traveled, and if he passes entirely around the earth he will have lost one day when he returns to the point from which he started. If two persons were to start from the same place and travel around the earth in opposite directions, they would differ from each other two days in their reckoning when they met in the place from which they started. The reason for having a date line is clear from this explanation, else it would be impossible to reckon days correctly, and travelers would differ in their time from that kept by people located at considerable distances east or west from the starting point.

International Geophysical Year, THE (abbreviated I.G.Y.), a concentrated study of the earth between July 1, 1957, and Dec. 31, 1958. During this period more than 30,000 scientists, technicians, and observers of some 66 nations cooperated in an intensive study of the earth and its physical environment. The I.G.Y. was broadly planned by the Comité Spécial de l'Année Géophysique Internationale (CSAGI) of the International Council of Scientific Unions. Country programs were organized and executed by the principal scientific body of each participating nation. The U.S. program was developed by the U.S. National Committee for the I.G.Y., established by the National Acad. of Sciences—National Research Council. Federal funds were administered by the National Science Foundation.

The objective of the I.G.Y. was to gain a broader understanding of man's physical environment. Because the events and phenomena establishing this environment were dynamic, changing with position and fluctuating with time, the I.G.Y. particularly emphasized those fields which required simultaneous measurements at many sites in order to get a world view of what was happening. The most important of these fields from this point of view were those concerned with the earth's heat and water budget (oceanography, glaciology, and meteorology) and those concerned with the high atmosphere (solar activity, aurora and airglow, cosmic rays, geomagnetism, and ionospheric physics). Studies in these last five fields required the undertaking of two major programs using rockets and satellites. In addition, largely because the I.G.Y. afforded a unique opportunity for studies in regions ordinarily unfrequented by man, investigations were also conducted in three fields of the earth sciences—seismology, gravimetry, and longitude and latitude determinations.

The very magnitude of the effort led to an overwhelming body of results, enough material to support years of theoretical analysis before the value of the research was exhausted. It was possible, however, to make a preliminary assessment of the achievements of the I.G.Y. From a scientific point of view, these were primarily twofold: (*1*) the gathering of data, and (*2*) the realization of specific discoveries meaningful and provocative in themselves.

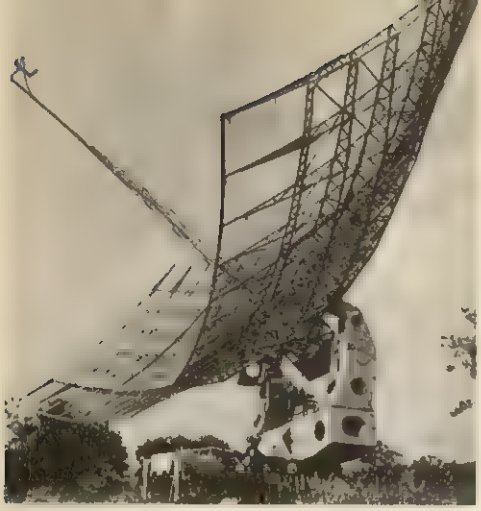
United Press Photo

RESEARCH ROCKET

The International Geophysical Year was launched by the U.S. Navy with a project to study solar flares

DATA: The accumulation of a vast body of data in each of the fields investigated was important to the understanding of each field and, because many of these fields were intimately related, to the establishment of correlations among the fields. In this objective, the I.G.Y. was extraordinarily successful, for the body of data that was accumulated was monumental. For example, one project in the field of ionospheric physics led to the acquisition of *ca.* 15,000,000 frames of film recording the behavior of the ionosphere at 175 stations scattered around the world. The upper-air meteorological program accumulated 1,000,000 records of such quantities as pressure, temperature, and humidity at various altitudes up to *ca.* 100,000 ft.

To cope with this body of data, three World Data Centers were established—one in the U.S. under the direction of the National Acad. of Sciences, the second in the U.S.S.R. under the direction of the Soviet Acad. of Sciences, and a third distributed by fields in Western Europe, Australia, and Japan. Each center catalogued and indexed data flowing to it and provided copies for the other centers. The activities of these centers were to continue beyond the expiration date of the I.G.Y. The continued publication of processed data in the form of tables of numbers and graphs provides an even broader dissemination of the measurements and observation made by the I.G.Y. scientists.



United Press Photo

RUSSIAN RADIOTELESCOPE

Discoveries: While the profuse and detailed data described above would require extensive analysis before interpretations could be made, many specific discoveries of the I.G.Y. were readily comprehensible. These discoveries turned out to be numerous and of the greatest significance to scientific knowledge, as perhaps suggested in the following representative sample.

Earth Sciences: The application of seismic sounding techniques in the antarctic led to the acquisition of important and new knowledge of that 6,000,000-sq.-m. continent of snow and ice. The profile of the underlying land mass was delineated in many regions. As a result, it was possible to describe Antarctica as a complex region consisting of mountains, mountain chains, and islands, particularly in the coastal areas. Many of these mountains, even were the ice to melt, would remain beneath sea level; some would protrude above sea level but are now hidden by thousands of feet of snow and ice; and only a few mountains are visible from the surface. Even parts of the interior were found to be below sea level. Evidence was found to substantiate a 50-year-old theory that a deep, ice-filled trough extending from the Weddell Sea to the Ross Sea separates Antarctica into two subcontinents.

These measurements permitted scientists to revise their estimates of the total amount of snow and ice on earth. The earlier figure of some 3,200,000 cu. m. of ice was to be revised upward by about 40 per cent, for much more ice was discovered in Antarctica—which accounted for 90 per cent of all snow and ice—than had been suspected. The availability of this new estimate was most important in climatology, because of the complex interrelationships among water in its liquid, frozen, and gaseous forms, the energy balance of the planet, and the dynamics of wind and ocean currents.

An analysis of the orbit of the first Vanguard (*q.v.*), an earth satellite (*q.v.*), revealed that the traditional concept of the earth as a spheroid which is flattened at the poles and bulging at the equator (owing to its rotation) must be modified. Apparently the true shape of the earth is more like that of a pear, with the narrow end in the Northern Hemisphere and the broad end in the Southern. Thus the North Pole is about 50 ft. farther from the earth's center than previously believed, while the South Pole is about the same distance closer.

Heat and Water: This area embraced studies in oceanography, glaciology, and meteorology. Of particular general interest were some of the findings in oceanography (*q.v.*). Here some major and hitherto-unsuspected gross features of the planet were discovered. Two huge oceanic currents were found. One was found to flow beneath the well-known Gulf Stream, traveling in the opposite direction at a rate of about 8 m. per day. A second current was found to flow between 200 and 1,000 ft. beneath the surface Equatorial Current in the Pacific. Both of these currents were found to be the equivalent of huge rivers. Deep trenches and mountain chains were also discovered in the seas, while, in the course of studying the bottoms of oceans, rich minerals were discovered in a thin layer of sludge spread over millions of square miles of the southwest Pacific.

Aside from the seismic studies in the antarctic, glaciological work was concerned with studies of the many features of glaciers and snow and ice sheets. In one of the programs, cores were taken, in both Antarctica and Greenland, of snow and ice. (These specimens can be analyzed much in the way tree rings are read, and they provide a frozen record of past weather and climate.) For example, the amount of precipitation between the north and south polar regions turned out to differ markedly, being almost twice as much in the far north as in the antarctic regions. Such studies would be of considerable importance to the detection of future climatological trends.

The High Atmosphere: Particular attention was given to the effect of solar particles and radiations on the earth's upper atmosphere. Simultaneous studies were made of auroral displays, geomagnetic storms, and ionospheric disturbances in conjunction with studies of solar flares. The use of rockets led to much new information about the variation of pressures, temperatures, density, and composition with altitude. One of the striking discoveries was the presence of X-rays in the lowest regions of the ionosphere. It was also found that these X-rays have their origin in the solar corona and that they are predominantly responsible for the increased electrification of the lower ionosphere, in turn leading to radio-communications blackouts.

The successful use of satellites was significant for two reasons: (*1*) in ushering in a new age of

space exploration and research, and (2) in contributing startling new knowledge. Here the most significant finding was the discovery of the Van Allen radiation zones, which contain energetic protons and electrons trapped by the earth's magnetic field. There are actually two Van Allen zones: (1) an inner and smaller one which lies within one earth radius of the surface and encircles the earth in the vicinity of the equator; and (2) an outer one which extends from roughly 2 to 3 earth radii from the surface and arcs along geomagnetic lines of force, surrounding almost the entire earth although less intense in the neighborhood of the geomagnetic poles. When the Van Allen radiation impinges on rocket or satellite vehicles, numerous powerful X-rays are produced which pose a hazard for space travelers. It is believed that radiation "leaking" from the Van Allen zones near the geomagnetic poles has some connection with the aurora. Further studies into the relationships among the Van Allen zones, auroras, and geomagnetic phenomena are in active progress.

CONCLUSION: The marked success of the I.G.Y. has engendered further international collaboration in geophysics, under the auspices of the International Geophysics Committee (C.I.G.) of the International Council of Scientific Unions (I.C.S.U.). Several areas—the earth sciences, the earth's heat and water budget, and the upper atmosphere—are receiving special attention. At the end of 1958, the post-I.G.Y. program in Antarctica was fully under way. Another major program, the World Magnetic Survey, has also been begun and will reach its peak during 1964-65, a year of minimum solar activity. The same year will be important for studies of the upper atmosphere and interplanetary space.

International Institute of Agriculture, founded in Rome, Italy, in 1905 at the suggestion of an American, David Lubin, absorbed by the Food and Agriculture Organization of the U.N. in 1946. The purpose of the institute was the gathering, assembling, and disseminating of information on the production and distribution of agricultural products throughout the world.

International Labor Organization, an organization of associated states which seeks by international action to improve labor conditions, raise living standards, and further economic and social stability. The Organization was established in 1919 by the treaties of peace and was associated with the League of Nations until the latter's dissolution in April 1946 and in the same year became a specialized agency of the U.N.

The machinery of the Organization comprises the International Labor Conference, the Governing Body, and the International Labor Office.

The conference, which usually meets annually, is composed of four delegates from each of the member states, together with their advisers. Two of these delegates represent the government, one represents management, and one represents labor. The principal decisions of the conference take the form of International Labor Conventions and Recommendations. The member states are obligated to bring conventions before their competent national authorities for possible ratification. If a state ratifies a convention, it is required to take measures to make effective its provisions, and to report annually on these measures to the International Labor Office. The member states are required to consider recommendations with a view to effect being given to their provisions by legislation or otherwise. As of the end of 1961, the conference had adopted 116 conventions and 115 recommendations. The conventions had received more than 2,400 ratifications.

The Governing Body functions as an executive council of the Organization. It has 40 members—10 management members, 10 labor members, and the representatives of 20 governments. Ten of the government seats are nonelective and are held permanently by the states of chief industrial importance. The Governing Body's duties include the fixing of the agenda of the conference, the appointment of the director of the International Labor Office, and the supervision of the work of the Office.

The International Labor Office is the secretariat of the Organization. Its functions include the collection and distribution of information on all subjects relating to the international adjustment of conditions of international life and labor, the preparation of documents on the various items of the agenda of the conference, the giving of assistance to governments in the framing of laws and regulations, the conduct of such special investigations as may be ordered by the conference or the Governing Body, the provision of machinery to assist in insuring the effective application of conventions, and the issuing of publications dealing with problems of industry and employment. In recent years its long-standing

INTERNATIONAL LABOR OFFICE

At Geneva, Switzerland

Courtesy Swiss Federal Railroad

program of aid to governments has been increased through participation in the U.N. program of expanded technical assistance to underdeveloped countries (the "Point Four" program). It also has the responsibility of facilitating the migration of surplus populations. Branch offices and correspondents are maintained all over the world.

The constitutional machinery of the Organization is supplemented by a number of commissions and committees whose purpose is to assist in furthering the work of the Organization in specific fields. These bodies include the Joint Maritime Commission, the Committee of Experts on the Application of Conventions, the Fact-Finding and Conciliation Committee on Freedom of Association, committees on work on plantations, salaried and professional workers, agriculture, cooperation, social security, accident prevention, industrial hygiene, women and children, workers' recreation, migration, labor statistics, and indigenous labor and industrial committees for major industries. Regional conferences of tripartite delegations from the states of particular regions are also convened by the Organization.

International Law, the term applied to what was formerly called the law of nations. It comprises the rules and established doctrines that govern states and nations in their conduct toward one another, and defines the relations of citizens of different countries in their social and commercial affairs. The system was created by modern nations and is recognized by the civilized peoples of the world. New rules are introduced by war and by treaties of peace. Among the more important matters provided for by international law is the equal and common right to sail upon the high seas, where all nations have equal authority to enforce their own laws and the established laws of nations. The domains of other nations cannot be interfered with, and, if a fugitive from justice escapes into a foreign state, the nation from which he escaped has no right to enter the foreign country for his arrest, but may request that he be surrendered.

Relations of different countries may be regulated by treaty without the interference of other nations, for which purpose all nations may send and receive ambassadors or delegations, and their persons and property must be protected properly. Any visiting foreigner is required to obey the laws of the country in which he sojourns, and is entitled to the same treatment as the natives. In making treaties ministers usually treat with each other or with duly qualified representatives, but the compacts formed are not deemed binding and formal until they have been ratified by the respective governments. Liberties are granted to all nations alike for the purpose of extending their navigation, improving commercial and agricultural industries, developing national resources, making exploring expeditions, and establishing trade relations. In time of war the property of the different nations involved, as well as of the persons engaged in unfriendly acts, is subject to capture anywhere, and neutral nations are bound to maintain impartiality between the contending countries. Neutral nations prevent interference on the part of their subjects in aiding the hostile country or in any manner giving aid or support to either contestant. See also *Blockade; Nuremberg War Trials.*

International Monetary Fund, THE, an institution organized to promote the cooperative solution of international currency problems. The Fund came into existence on Dec. 27, 1945. At the time of the inaugural meeting of its board of governors in March 1946, 39 countries had become members of the Fund. Proposals for the Fund were agreed upon at the International Monetary and Financial Conference held at Bretton Woods, N.H., July 1944. Participation of the U.S. was authorized by the Bretton Woods Agreements Act of July 31, 1945. See also *International Bank for Reconstruction and Development.*

The essential features of the Fund may be summarized in the following four main points: First, members of the Fund recognize that international currency problems are an international responsibility and can be solved only through international cooperation. Second, members agree to establish the parities of their currencies in consultation with the Fund and not to change these parities except after consultation with the Fund or with its concurrence. Third, members agree not to impose new restrictions on current international transactions except in consultation with the Fund, and to remove current restrictions as soon as conditions permit. Fourth, the Fund stands ready to sell foreign exchange to members in limited amounts to help them meet temporary payments deficits.

The Fund's executive board held its first meeting May 6, 1946, electing Camille Gutt, of Belgium, as the first chairman of the board and managing director. With some changes in membership, the board has been in continuous session ever since.

Before the International Fund began operations, each member was to agree with the Fund on the parity of its currency, and changes not to exceed one per cent above or below the established parity. However, changes in the par value of a currency may be made when a change is necessary to correct a continuing imbalance in a country's international economic position and then only after consultation with the Fund. Minor changes in parity aggregating 10 per cent in all may be made by a country after consulting the Fund but without requesting its concurrence.

The Fund's agreement to the establishment of par values in gold and U.S. dollars for the currencies of 32 member countries was announced on Dec. 18, 1946. The agreement provides that members shall consult the Fund before imposing additional restrictions on payments and transfers for current international transactions. The same provision applies to the transfer of earnings on investments, the repatriation of amortization on bonds, and depreciation on direct investments. The agreement also provides for progressive removal of discriminatory currency arrangements, multiple currency practices, and other devices destructive to international trade and investment.

The resources of the Fund are to be used to provide foreign currency to countries when their out-payments on current international account exceed their in-payments. This provision gives countries time to make appropriate adjustments without having to take such drastic measures as exchange depreciation or restriction of exchange transactions. Member countries in need of foreign exchange to meet current international obligations are permitted to buy the francs, pounds, or dollars they require from the Fund with their own currencies in limited amounts and in accordance with specified conditions, with the obligation to repurchase their own currencies from the Fund with gold, or with convertible foreign exchange, as soon as they are in a position to do so.

There began on Sept. 18, 1949, a wave of devaluations that involved within a few months the currencies of 22 Fund members and eight other countries. The members' proposals were submitted for approval to the executive board, which discussed them in the light of their relationship to one another in a cooperative procedure which had not existed prior to the Fund's establishment.

Some further revisions have taken place as members adjusted their exchange systems to changing conditions in consultation with the Fund. On the whole, close relations have been maintained between the Fund and its members, the Fund in numerous instances sending missions to confer with individual governments.

Foreign exchange transactions by the Fund are governed by the relevant provisions of the articles of agreement, as applied by the executive board. It was agreed in April 1948 that members receiving aid from the Economic Cooperation Admin. should request a purchase of U.S. dollars only in exceptional or unforeseen circumstances. From March 1, 1947, to April 30, 1962, sales of currencies from the Fund's holdings to member countries totaled the equivalent of $6,265,480,000. In the same period, $4,098,050,000 was repurchased. As of Aug. 31, 1962, 79 countries were members of the Fund. Resources amounted to over $15,000,000,000, of which about $3,000,000,000 was in gold.[1]

QUOTAS OF MEMBER COUNTRIES

(As of Aug. 31, 1962—in millions of dollars)

Country	*Amount*	*Country*	*Amount*
Afghanistan	22.50	Korea	18.75
Argentina	280.00	Laos	7.50
Australia	400.00	Lebanon	6.75
Austria	75.00	Liberia	11.25
Belgium	337.50	Libya	11.00
Bolivia	22.50	Luxemburg	12.00
Brazil	280.00	Malaya	32.50
Burma	30.00	Mexico	180.00
Canada	550.00	Morocco	52.50
Ceylon	45.00	Nepal	7.50
Chile	100.00	Netherlands	412.50
China	550.00	New Zealand	125.00
Colombia	100.00	Nicaragua	11.25
Costa Rica	15.00	Nigeria	50.00
Cuba	50.00	Norway	100.00
Cyprus	11.25	Pakistan	150.00
Denmark	130.00	Panama	0.50
Dominican Rep.	15.00	Paraguay	11.25
Ecuador	15.00	Peru	32.50
El Salvador	11.25	Philippines	75.00
Ethiopia	11.40	Portugal	60.00
Finland	57.00	Saudi Arabia	55.00
France	787.50	Senegal	7.50
Germany, West	787.50	Somalia	11.25
Ghana	35.00	South Africa	150.00
Great Britain	1,950.00	Spain	150.00
Greece	60.00	Sudan	15.00
Guatemala	15.00	Sweden	150.00
Haiti	11.25	Syrian Arab Rep.	15.00
Honduras	11.25	Thailand	45.00
Iceland	11.25	Togo	11.25
India	600.00	Tunisia	16.20
Indonesia	165.00	Turkey	86.00
Iran	70.00	United Arab Rep.	90.00
Iraq	15.00	United States	4,125.00
Ireland	45.00	Uruguay	30.00
Israel	25.00	Venezuela	150.00
Italy	270.00	Viet Nam	18.50
Japan	500.00	Yugoslavia	120.00
Jordan	6.30		

International Peace Bureau (*Bureau International Permanent de la Paix*), a pacifist organization established in 1892. The foundation of the Bureau was laid at the Third International Peace Conference at Rome in 1891. The purpose of the Bureau was to serve as a central organization for all peace movements. Headquarters of the Bureau were in Geneva, Switzerland, and a branch was established in the U.S. in 1894. The effectiveness of the organization was recognized in 1910 when it was awarded the Nobel Prize for Peace.

International Peace Conference, a conference held in The Hague, The Netherlands, from May 18 to July 29, 1899. It was convened at the suggestion of the Czar of Russia, who advanced an invitation to the principal nations of

[1] Subscriptions to the Fund are in the form of gold and national currencies. The gold subscription of each member country is 25 per cent of its quota, or 10 per cent of its net official holdings of gold and U.S. dollars, whichever is smaller.

the world to participate in a conference with the view of securing a gradual reduction of naval and military armaments. Twenty-six countries of the world participated, and the total delegates in attendance numbered 101. The principal work of the conference consisted in adopting a perfected code of the rules of war, recommending the larger use of balloons in warfare, and recommending that the question of the rights of neutrals and private property be considered by future conventions.

International Refugee Organization. See *Displaced Persons.*

International Trade Organization, a proposed specialized agency of the U.N., under discussion for several years beginning in 1946, and indefinitely postponed in 1959. In 1946 the Economic and Social Council of the U.N. resolved to draw up a charter on trade and employment. A draft charter was prepared in August 1947 by a preparatory committee and was completed at a world trade conference, November 1947 to March 1948. This conference was attended by 57 countries, with 54 approving the text of the charter. The only important absentee was Soviet Russia. The charter was to become effective and the I.T.O. to be created if 20 countries accepted the charter by Sept. 30, 1949. Pending creation of I.T.O., an interim commission was established. See also *Reciprocity; United Nations.*

The main aims included the promotion of the volume of world trade, the encouragement of economic development in the less developed countries, the reduction of trade barriers, the elimination of discriminatory practices such as import quotas, promotion of high employment levels, and the provision of machinery for settling commercial disputes between countries and for dealing with the causes of trade warfare.

Closely related to the charter is the General Agreement on Tariffs and Trade (G.A.T.T.), negotiated at Geneva in 1947, and afterward amplified by other meetings, by which 32 countries, controlling some 80 per cent of the world's trade, agreed to multilateral tariff reductions. Some 60,000 items of trade were included in such agreements. Early in 1951, the U.S. and Great Britain indicated that they did not intend to ratify the I.T.O. charter, but preferred to work toward the strengthening of the G.A.T.T.

Interparliamentary Union, an organization for promoting the development of democratic institutions, personal contacts between legislators, and the peaceful settlement of international disputes. It was founded at Paris in 1888. Annual meetings, except in time of war, have been held since 1889. Perpetual membership is open to any member of a national parliamentary body or congress. The U.S. first sent a representative in 1897.

The Union was influential in bringing about the establishment of the permanent Arbitration Court at The Hague (1899), and in the calling of the second Hague Conference (1907). After World War I the organization attempted to aid in peace and reconstruction work. After World War II the organization was recognized by the U.N. as a non-governmental organization with consultative status. Its headquarters are at Geneva, Switzerland. See also *Arbitration.*

Interpolation (*ĭn-tĕr-pō-lā'shŭn*), in literature, introduction of alien matter into a literary work. Words, sentences, or whole chapters have sometimes been interpolated into famous old manuscripts or writings of any kind. This falsification is most frequently carried out to support a contention either of the original author or of a recent authority.

In mathematics, the process of finding a function for some value of the variable intermediate between values for which the function is known. The usual method is to assume uniform change of the function and to determine its value by proportion. A more exact method was devised by Joseph L. Lagrange (1736-1813), Italian mathematician. Interpolation is frequently necessary in order to find values of logarithms and trigonometric functions from tables.

Interregnum (*ĭn-tĕr-rĕg'nŭm*), the time during which a throne remains vacant after the death of a sovereign, his abdication or expulsion.

Interrupter (*ĭn-tę-rŭpt'ĕr*), a mechanical device for periodically terminating flow of electric current to a piece of apparatus. The Wagner hammer used with the induction coil is an interrupter depending for its operation upon mechanical vibrations of a sheet spring to break an electrical contact and stop current flow. The Wehnelt interrupter uses the formation of gas bubbles at an electrode to stop current flow.

Interstate Commerce (*ĭn'tĕr-stāt ĕŏm'-mĕrç*), the name applied to the trade among the several states of the U.S. After the American Revolution, trade between the 13 states of the new confederacy showed need of Federal control. As a result, the Constitution as written by the Philadelphia Convention of 1787 provided (Art. 1, sec. 8, cl. 3): "The Congress shall have power . . . to regulate commerce . . . among the several states." However, not until 1887 did Congress find it necessary to pass the Interstate Commerce Act, intended to regulate trade between the states. The act defined interstate common carriers, including express companies (after 1906), sleeping-car companies, and pipe lines, and (after 1920) telegraph, telephone, and cable companies operated by wire or wireless.

The Interstate Commerce Act provided that all rates under its jurisdiction be reasonable and just; forbade the issuance of passes except to rail-

road employees, for charity, or for public purposes; declared unlawful both the practice of pooling for rate maintenance, and combinations in restraint of trade; stated that rate schedules were to be made public and not changed without due notice.

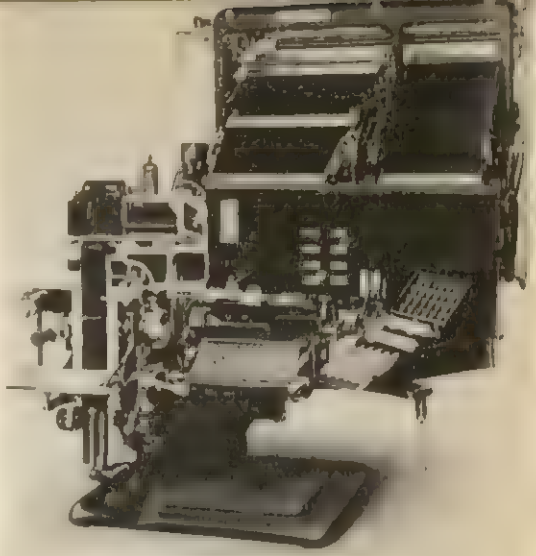
The act created the Interstate Commerce Commission to supervise and administer its regulations, the powers of which have been progressively extended since its inception. The five members of the Commission originally provided for have now been increased to 11, appointed by the President. The Hepburn Act of 1906 conferred upon the Commission power to fix rates and to set aside those rates held to be unreasonable.

The Panama Canal Act of 1912 enabled the Commission to establish rate-fixed through routes between rail-and-water carriers for transportation of property between states. The Transportation Act of 1920 empowered the Commission to fix intrastate rates to relieve discrimination against interstate commerce.

The Motor Carrier Act of 1935 gives the Commission jurisdiction over common carriers and contract carriers by motor vehicle, and over transportation brokers engaging in interstate or foreign commerce. Extensive jurisdiction over water carriers was conferred upon the Commission by the Transportation Act of 1940. An act of 1942 gave the Commission authority over freight forwarders, who are persons other than carriers using facilities subject to control by other parts of the Act.

Under the same clause of the Constitution which was instrumental in creating the Interstate Commerce Act of 1887, Congress passed laws in 1888 and 1898 regulating arbitration between interstate common carriers and their employees. The Sherman Anti-Trust Act of 1890 comes under this type of legislation, but was limited by judgment of the Supreme Court to apply only to "unreasonable" combinations in restraint of trade. Congress has also passed laws against the carriage of condemned carcasses and lottery tickets (1895), obscene literature (1897), and dairy products falsely marked (1902). In 1903, Congress created a Bureau of Corporations with powers of investigating all interstate and foreign commerce corporations not under the jurisdiction of the Interstate Commerce Commission.

Intertype (*in'tĕr-fip*), a type-line composing and slug-casting machine made by Intertype Corp. of Brooklyn, N.Y., and England, and used for the composition of lines of type matter for all classes of printing. The modern machines are equipped with several fonts of intaglio matrices stored column-wise according to character in channeled magazines. The matrices are composed into a line by manipulation of a keyboard, the composed line being "justified" to the line-measure



INTERTYPE COMPOSING MACHINE

desired and then delivered to a mold into which molten metal is forcibly injected to cast the type characters of the matrices on the upper edge of a type metal slug. After the cast the matrices are distributed automatically back to their proper storage channels in the magazine.

An electric power shift enables quick and effortless selection of any desired font (size or style of type face) and a finger-tip control enables different fonts to be "mixed" in any line. Lines may be cast flush left, flush right or central of the slug automatically. As many as six different size-casting molds are provided to produce a variety of line-lengths and sizes of type. The machine is equipped with a number of exclusive automatic safety devices and with automatic melting pot and mold temperature controls. See also *Linotype*.

Intervention (*ĭn-tĕr-vĕn'shŭn*), in civil law, proceedings in a suit or action by which a third person is permitted by the court either to join the plaintiff against the defendant or to unite with the defendant against the plaintiff in order to resist his claim affecting the interests of both.

Intestines (*ĭn-tĕs'tĭnz*), the portion of the digestive system situated below the stomach. It is commonly divided into the small and large intestines. The former has an average length of about 23 feet and includes the duodenum, jejunum, and ileum, while the latter, which extends nearly around the small intestine, includes the caecum, colon, and rectum. The *small intestine* extends from the pylorus of the stomach to a valvelike opening at the entrance of the large intestine, near the right groin. It is from 1 to 1½ in. in diameter. The first 10 in., known as the duodenum, receives the inflow from the ducts of the pancreas and liver. The upper two-fifths of the remainder constitute the jejunum,

and the lower three-fifths forms the ileum. On the interior are many transverse projections and an immense number of minute threadlike processes called *villi*. These villi stand up and resemble the pile of velvet when immersed in water. Each villus contains a lacteal, a vein, and an artery. Food in the stomach moves forward through *peristaltic action*, which consists of slow and successive contractions of the muscular fibers within the tube.

The *large intestine* is from 5 to 6 ft. long, from 1 to 2½ in. wide, and is greatly wrinkled and sacculated. Only a few glands occur in the depression of its mucous membrane, which is smooth and contains no villi. Between the small intestine and the colon is a valve of two segments, which prevents the contents of the colon from returning to the small intestines. Projecting from the lower end of the first part of the colon is a narrow, tapering tube known as the *vermiform appendix*. The function of this organ, situated in the right side of the lower abdomen, is considered unimportant (see *Appendicitis*).

Intoxication (*ĭn-tŏks-ĭ-kā'shŭn*), the state produced in the system by the excessive use of a stimulant, such as opium, chloral, belladonna, and alcoholic liquids. The intoxication is acute when a considerable quantity of poisonous substances is taken at once, especially by a person not accustomed to their use. In the first stage of slight intoxication the blood circulates quite rapidly and the nervous and mental processes are stimulated. This state of excitement is soon followed by the second stage, in which the baser traits are manifested and the sense of propriety is lost. In the third stage an intoxicated person suffers from dizziness, stupor, double vision, and greatly weakened consciousness, and in some cases by fits of delirium. Delirium tremens often results from habitual intoxication. The excessive use of liquor frequently induces vomiting, especially in those not accustomed to it. A cathartic, an emetic, or a Turkish bath may relieve a person becoming drowsy from intoxication, and in extreme cases a stomach pump may be employed.

Introvert (*ĭn'trō-vûrt*), a psychological term signifying a person who is inclined toward the inner world of his own personality. The instincts of such a person turn upon himself. His main satisfactions will be imaginary responses to impressions of the outside world. Fantasy plays a great role in the emotions of this type. The contemplative individual, the thinker and, as a most extreme case, the mystic (*q.v.*) are typical introverts.

Whether a grown-up personality becomes essentially an introvert or an extrovert depends on inborn qualities as well as conditions. A child governed by a possessive and imperious mother is likely to become shy, and in some respects an introvert. Social and economic pressure in youth, compelling people to restrain themselves, has a tendency to make them more introverted. In the same way all kinds of physical limitations, such as a limp, extreme smallness or shortsightedness, incline a person to introversion. Stammering, stage fright, extreme shyness may be the results of such introversion. Psychoanalysis (*q.v.*) may help in such cases and even cure the cause of these symptoms completely after certain earlier experiences which helped develop the disposition have been ascertained.

Literature has dealt extensively with the introvert and his reactions. Examples of the introvert in literature are Hamlet and the leading figures of Stendhal, Dostoevsky, Proust, James Joyce (*qq.v.*) and many modern authors. See also *Extrovert*.

Intuition (*ĭn-tū-ĭsh'ŭn*), a philosophical term, defining the possibility of knowledge through immediate apprehension. This form of acquiring knowledge is contrasted to the gaining of knowledge through a sequence of logical conclusions. The objects of intuitive knowledge are called primary ideas or axioms. Our concept of space and time, of our own personal identity, are such *a priori* knowledges or primary ideas, and cannot be derived from any other concepts. Some philosophers believe also that our ideas about right and wrong and many other abstract concepts are also given *a priori* (see *Intuitionalism*).

The term intuition is today used in a slightly modified way. One speaks of knowing a personality "intuitively," meaning actually that one's judgment is not based on observations or logical deductions. The correct terminology would be "instinctively." One also contrasts "intuitive" and "intellectual" artists, actually meaning the contrast between artists who work naïvely and those who work more rationally. Thus intuition is used for all those functions of the human mind which cannot be explained logically and rationally. This application of the term is, however, not exact; its use should rather be limited to the exact philosophical definition as given above.

Intuitionism (*ĭn-tū-ĭsh'ŭn-ĭz'm*), or INTUITIONALISM, a philosophical term signifying the concept that the truth of a specific knowledge in certain cases may be apprehended *a priori* (*q.v.*), without such a sequence of arguments as needed, for example, in mathematics to prove the validity of a theorem. Thus, in many instances, the intuitionists believe, immediate intuition might become the basis of knowledge. Therefore intuitionalism represents the strongest possible contrast to empiricism (*q.v.*). In other words, the philosophers who believe in the possibility of a knowledge *a priori* are opposed by the philosophers who believe only in a knowledge *a posteriori*.

Intuitionalism in a narrower sense refers to ethics (*q.v.*) only and means that the rightness

or wrongness of certain actions (moral or immoral) is evident by intuition, without any consideration of the practical consequences of these actions. In other words, we do not need any experience, in the belief of the ethical intuitionists, to judge about good and evil. The moral values are self-understood, and our "conscience" apprehends these values immediately, *a priori*.

Since the very beginning of ethics as a branch of philosophy, the discussion over the validity of this concept has never ceased. The fact that primitive tribes obviously have no intuitive concepts of right or wrong has been commonly used against the intuitionists. All materialistic philosophies try, of course, to explain the ideas of good and evil merely by circumstances, tradition, and specific conditions. They refer to the undeniable fact that moral systems differ in various countries, civilizations, and periods.

Inverchapel (*ĭn'vĕr-chăp-ĕl*), ARCHIBALD JOHN CLARK KERR, created 1st Baron Inverchapel in 1946, diplomat, born in Scotland, 1882; died in Greenock, Scotland, July 5, 1951. He was educated by private tutors and entered the diplomatic service in 1906. He was appointed minister to Sweden in 1931, to Bagdad, 1935, and to China, 1937. He became British ambassador to the U.S.S.R., 1942, and was ambassador to the U.S., 1946-48.

Inverness (*ĭn-vĕr-nĕs'*), a town in Scotland, capital of Inverness-shire, on the Ness River, 105 m. N.W. of Aberdeen. It is located near the Moray Firth, on the Caledonian Canal, and has railway transportation facilities. The chief buildings include the county hall, the cathedral, an insane asylum, and the Royal Acad. Among the manufactures are leather, cordage, spirituous liquors, woolen goods, ironware, and sailing vessels. Inverness was the capital of the Picts. It was destroyed by Charles Stuart in 1746. Population, *ca.* 22,000.

Invertebrata (*ĭn-vĕr-tē-brā'tä*), a subdivision of the animal kingdom. It includes the animals which have no vertebral column or backbone, and is distinguished from the higher group that possesses a vertebral column, known as *vertebrata*. In the invertebrate animals nothing resembling a cartilaginous spinal column is found, and the more solid portions of the body are on the outside, thus constituting a protective shell, as in the case of the oyster, lobster, and clam. Naturalists now recognize five different divisions of the invertebrate animals: the mollusca, protozoa, annulosa, coelenterata, and echinozoa or annuloida.

Investiture (*ĭn-vĕs'tĭ-tûr*), in feudal law, a ceremony occasioned by the delivery of lands. This act was witnessed by other tenants who, in case of a dispute regarding the title, were afterwards called upon to decide on the ownership of the property. Investiture had its place in the days when writing was little known and the changing of title to a property could not be recorded.

Clerical investiture, specifically meaning presentation of the pastoral staff and pastoral ring, came to mean the entire procedure of election and installation of clerics. It occasioned controversy during the Middle Ages, when the emperor as well as the pope held the power of investiture of the clerics in the Holy Roman Empire. The struggle came to a head in the 11th century. Not until about a century later, however, was a compromise reached in the Concordat of Worms (1122) between Pope Calixtus II and Emperor Henry V. From that time on, the clergy was selected by free election held in the presence of imperial authority and was bound to support the emperor. The emperor retained the right of investiture by the touch of the scepter alone.

Investment Acts (*ĭn-vĕst'mĕnt ăkts*). See *Securities and Exchange Commission.*

Investment Company (*ĭn-vĕst'mĕnt kŭm'pą-nĭ*), a company in which investors buy shares to pool their money for investment, to achieve (*1*) diversification of stock ownership, thus lessening the risks of stock investment; (*2*) professional management; and (*3*) the convenience of dividends paid all from one source at one time. There are two types of investment company: the *closed-end,* which has a fixed number of shares outstanding to be traded like any individual security; and the *open-end,* also called *mutual fund,* which continually issues new shares and buys back shares already issued. The price of shares in a mutual fund is determined by the actual value of the securities owned by the company (called the asset value), usually plus a sales charge. Shares are redeemed by the company at asset value, usually without charge. Various share-

INVERNESS ALONG THE NESS RIVER

holder services are offered, including automatic reinvestment of dividends and systematic purchase and withdrawal plans.

Open-end investment companies are of three major types: the balanced fund, which invests in common and preferred stocks and in bonds; the growth, or stock, fund, which invests principally in common stocks chosen for long-term appreciation; and the income fund, which invests in securities chosen to provide high current income. In 1959 there were more than 150 open-end companies, with more than 1,700,000 shareholders and with assets totaling more than $13,700,000,000.

Involution and Evolution (*ĭn-vô-lū'shŭn, ĕv-ô-lū'shŭn*), in mathematics, two operations which are converse to each other. The object of *involution* is to raise a number to any power, which is done by multiplying the number by itself, as 2×2×2=8. Thus, the third power of two is eight. On the other hand, *evolution* is the extraction of a root of any number; that is, by means of it may be found what number, when raised to a certain power, gives the known number. For instance, 64 is the power of some number; by evolution it is found that 8 is the square root; thus 8 multiplied by 8 equals 64.

Io (*ī'ō*), in Greek mythology, a priestess of Hera and the daughter of Inachus (a river-god, also represented as king of Argos). She was loved by Zeus, who changed her into a white heifer to conceal her from his jealous wife Hera. When Hera asked that the heifer be given to her, Zeus complied, and Hera gave the heifer to the many-eyed Argus to guard. Zeus asked Hermes for aid. Hermes put Argus to sleep by telling him stories and, after all his eyes had closed, killed him. (Hera took the eyes and put them in the tail of her peacock.) Hera tormented Io with a gadfly, which pursued her constantly. In a frenzy, Io jumped into the sea (Ionian Sea, named for her), swam the strait (Bosporus, meaning Ford of the Cow, also named for her), and finally wandered into Egypt, where Zeus restored her to human form and she bore him a son, Epaphus.

Iodine (*ī'ô-dĭn*), a bluish-black nonmetallic elementary crystalline substance (Symbol, I; atomic number, 53; atomic weight, 126.92). When heated, it yields fumes of a rich violet hue. Iodine belongs to the halogen group of elements and is similar to bromine and chlorine. It is obtained principally from the ash of seaweeds called kelp but occurs also in oceanic waters and mineral springs. Iodine is found more or less abundantly in marine molluscous animals, in cod-liver oil, and in certain land plants. The lead, silver, and zinc ores of Mexico and Chile contain iodine. It is employed in medicine and in photography. In medicine, it is used either in the pure state or as potassium iodide and is useful as an antiseptic (tincture of iodine) and as an agent to kill parasites. Iodine has been used for many years in the treatment of toxic goiter (see *Thyroid*) and for advanced stages of syphilis. Recently, radioactive iodine has given promise of great effectiveness in Graves' disease (exophthalmic goiter). In photography, iodine is used to prepare aniline colors and for other purposes.

Iodoform (*ī-ŏ'dô-fôrm*), a compound of iodine, carbon, and hydrogen. It is similar to chloroform but differs from the latter in that the chlorine is replaced with iodine. Iodoform is a yellow crystalline substance with a penetrating odor and a sweetish taste. In water it is nearly insoluble, but it may be dissolved readily in ether or alcohol. It is valuable as a medicine, both as an antiseptic and an anesthetic. Because it is a solid, it is not employed as a general anesthetic by inhalation, but it is used as a local application to relieve pain, as in sores and ulcers.

Iola (*ī-ō'la*), a city in Kansas, county seat of Allen County, near the Neosho River, 37 m. w. of Ft. Scott. It is on the Missouri Pacific, the Missouri, Kansas & Texas, and the Santa Fe R.R.'s and is surrounded by a farming (cattle feeding, production of corn and wheat) and natural-gas producing region. An industrial as well as a business and commercial center, it manufactures cement, castings and oil field equipment, and insulating materials. Food processing (meat, dairy products, honey, and chocolate) is also important. Iola, founded in 1859, was chartered as a city in 1898. Population, 1930, 7,160; 1940, 7,244; in 1950, 7,094.

Ion (*ī'ŭn*), an atom or group of atoms bearing an electric charge. Ions are found in solutions of acids, bases, and salts, and, under certain physical conditions, in gases as well. Liquids and gases containing ions are said to be "ionized." According to the Arrhenius theory, molecules of acids, bases, and salts dissociate into two or more ions when in solution. This theory provides an explanation for electrolysis (*q.v.*), which consists of the separation of ions in solution by the passage of electric current. Positive ions are called *cations,* because they are attracted to the negative electrode or *cathode,* and negative ions are called *anions,* because they are attracted to the positive electrode or *anode.*

Gases may be ionized by electrical discharges, such as sparks and arcs, and by the passage through them of radiation, either in the form of fast charged particles (electrons, alpha particles, etc.) or as X- or gamma rays. The earth's atmosphere normally contains several thousand ions per cubic centimeter. It is believed that interstellar space is filled with a very thin gas consisting mostly of ionized hydrogen.

Iona (*ī-ō'na*), the modern name applied to the most celebrated island of the Hebrides, an

island group lying northwest of Scotland. The length is 3½ m.; breadth, 1½ m.; and area, 2,265 acres. Its history began in 563, when St. Columba landed with 12 disciples and built a monastery. The soil is exceedingly fertile and potatoes, barley, and oats are the chief products. The monastery established by St. Columba was the first church of the Picts.

Ionia (*ī-ō'nĭ-ą*), an ancient region of Asia Minor, comprising what is now a coastal strip (90 m. long and 20 to 30 m. wide) of western Turkey and some of the islands in the eastern part of the Aegean Sea, some of which belong to Greece. It was settled about 1000 B.C. by Greek colonists, known as Ionians, who were driven from the Greek mainland, particularly from around Athens, by the Dorians. (The Greeks were divided into four main branches—Achaeans, Dorians, Aeolians, and Ionians—and each had its own language and culture.) Ionia had 12 cities of importance—Miletus, Myus, Priene, Samos, Ephesus, Colophon, Lebedus, Teos, Erythrae, Chios, Clazomenae, and Phocaea—which maintained certain religious contacts centered around the temple of Poseidon at Mycale. Smyrna later joined the league. Ionia, endowed with fertile land and fine harbors and strategically located between Greece and Asia, became rich and important. It sent its colonists all over the Mediterranean and made immeasurable contributions, particularly between the 8th and 6th centuries B.C., to Greek art, literature, and philosophy. (See *Ionian School.*)

Ionia, having survived the Cimmerian invasion in the 7th century, was brought under Lydian rule during the reign of Croesus (560-546 B.C.). When Croesus was defeated (*ca.* 546 B.C.) by Cyrus, Ionia came under Persian domination. Aided by Athens and Eretria (part of ancient Ethiopia), the Ionians revolted (*ca.* 500 B.C.) against Darius I but were easily subdued. Darius, attempting to punish Athens and Eretria and to annex Greece, then embarked on his wars against Greece. Ionia was under Persian domination until it was subdued by the Greeks and Alexander the Great in 334 B.C. Remaining rich and prosperous during the eras of the Roman and Byzantine empires, Ionian culture was finally destroyed by the Turks in the late Middle Ages.

Ionia, a city in Michigan, seat of Ionia County, on the Grand River, *ca.* 34 m. E. of Grand Rapids. It is on the Grand Trunk and the Chesapeake & Ohio R.R.'s. The trade center of an agricultural region, it produces dairy products and automobile bodies. It is the site of the Michigan State Reformatory, and a state hospital for the criminal insane is nearby. Ionia was settled in 1833 and was incorporated as a city in 1873. Population, 1950, 6,412.

Ionian Islands (*ī-ō'nĭąn*), a chain of seven Greek islands, with their dependencies, in the Ionian Sea, off the western coast of Greece. The islands, whose total area is *ca.* 750 sq. m., are Cephalonia, Corfu, Cythera, Ithaca, Leukas, Paxos, and Zante. Much of the surface is mountainous; the highest point is on Cephalonia, where Mt. Aenos rises 5,314 ft. The warm, humid climate favors cultivation of currants, grapes, olives, grains, citrus fruits, and vegetables. Goats, sheep, and hogs are raised, and the chief industries are fishing, soapmaking, and boatbuilding. Settled by Greeks in ancient times, the islands were part of the Roman and Byzantine empires and later (14th-15th centuries) were controlled by Venice. After the end of the Venetian Republic (1797), they were ceded to France, but they were seized (1799) by a Russian-Turkish fleet and established as a republic under Russian occupation and Ottoman protection. The treaty of Tilsit (1807) restored them to France, and the treaty of Paris (1815) established a British protectorate over them. They were ceded to Greece in 1864. Population, *ca.* 238,000.

Ionian School, the oldest Greek school of philosophy, flourishing in Ionia in the 6th and 5th centuries B.C. Among its principal exponents were Anaxagoras, Anaximander, Anaximenes, Heraclitus and Thales (*qq.v.*). They sought to explain the material universe rationally and scientifically, in terms of natural elements (water, fire, air), matter, and energy.

Ionian Sea, part of the Mediterranean Sea lying between Greece and Italy, and containing the Ionian Islands (*q.v.*). It is connected on the north with the Adriatic Sea by the Strait of Otranto. In the northwest it forms an inlet off the Italian coast, known as the Gulf of Taranto.

Ionic Order (*ī-ŏn'ĭk*), one of three classic styles of Greek architecture (the other two are Doric and Corinthian). It is distinguished by the capital with its large spiral scrolls on either side running from front to rear, the slender proportions of its column, the 24 carved vertical flutings on its shaft, and the egg-and-dart molding below the capital. Resting on the column is the Ionic entablature, comprising the architrave (usually in three bands), the sculptured frieze, and the cornice. The order reached its full development in Ionia in the 6th century B.C. A century later, it was used in Greece, where only one complete example remains—the Erechtheum (*q.v.*), on the Acropolis at Athens. The Roman adaptation of this order (sometimes called Roman-Ionic) had heavier proportions. See *Column.*

Ionosphere (*ī-ŏn'ō-sfēr*), a region in the upper atmosphere which contains ions. The existence of such a region was proposed by Oliver Heavi-

side, of England, and later verified by F. Kennelly, of the U.S., as an explanation for the transmission (1901) of wireless signals across the Atlantic Ocean by Guglielmo Marconi (*q.v.*) despite the curvature of the earth. When some of the atoms and molecules in the upper atmosphere are ionized by the action of high-energy solar radiation, the resulting layer of charged particles behaves like a mirror to radio waves; this layer, together with the sea, can then channel radio waves for the immense distances (see illustration).

The ions are not distributed throughout the entire atmosphere (*q.v.*) The reason for this is that at high altitudes there is not enough gas present for the solar ultraviolet rays and X-rays to interact with, while at low altitudes all of the solar radiation energetic enough to cause ionization has already been absorbed. Over 30 years ago, a method was developed by Gregory Breit, of Yale Univ., and Mirle Tuve, of Carnegie Institution of Washington, for measuring the properties of the ionosphere. With their method a pulse of radio waves is sent upward from a ground station, and the time required for its echo to return from the ionosphere is measured. Since the velocity of radio waves in the atmosphere is known, the echo return time makes possible a determination of the height of the reflecting layer. Further, by varying the frequency of the radio waves, much valuable information on the nature of the ionosphere can be obtained.

Four distinct layers have been shown to exist in the ionosphere. The lowest is the *D* layer, centered at an altitude of about 43 m.; next is the *E* layer at 74 m.; and then the F_1 layer at 105 m. and the F_2 layer at 155 m. The *D* layer, unlike the others, tends to absorb rather than reflect radio waves, and when it is intensified during solar flares it disrupts long-distance radio communication. Normally, all the *D* layer does is to reduce the intensity of radio waves which pass through it on their way to the *E*, F_1, and F_2 layers where they are reflected down to the earth again.

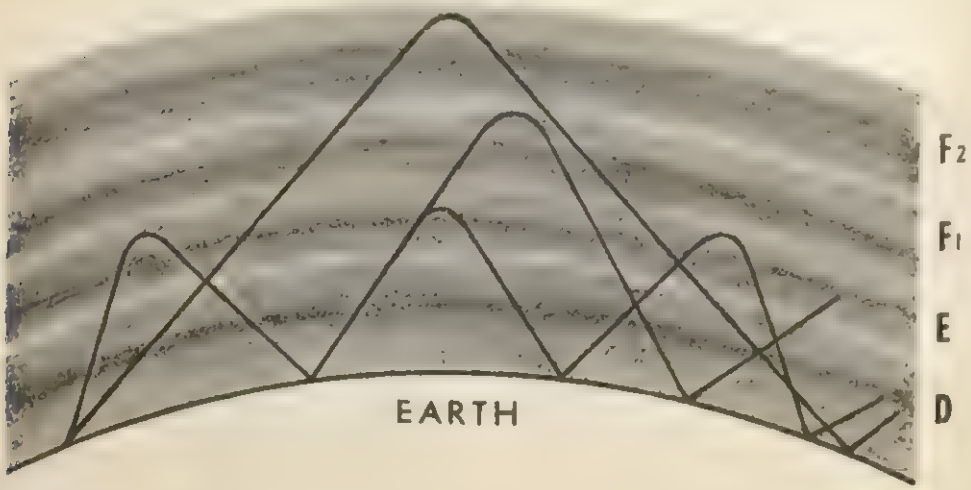
Several possible paths by which radio waves propagate over long distances with the help of the ionosphere are shown in the illustration; for really great distances, reflection from the *E* layer, which is relatively low, is of no significance, since waves reflected by it must undergo a large number of up and down passages through the atmosphere which reduce their intensity. At night, the *D* and *E* layers disappear and the F_1 and F_2 layers coalesce into a single layer.

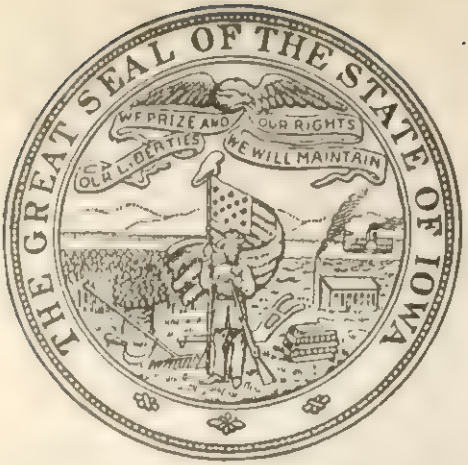
Iowa (*ī'ô-wạ*), a river in the state of Iowa, a tributary of the Mississippi, *ca.* 300 m. long. It has its source in two streams which rise and converge in north central Iowa. The river thus formed flows in a southeasterly direction across the state, meeting its tributary, the Cedar, shortly before it joins the Mississippi between Muscatine and Burlington.

Iowa, a state in the West North Central section of the U.S., long an outstanding agricultural state which in the past decade has developed its industry to the point of achieving a balanced economy. Iowa is second to California in total farm income. It leads the nation in production of corn, oats, livestock, and livestock products; and it has more than one-fifth of all the hogs, timothy seed, and popcorn in

LAYERS IN THE IONOSPHERE

Possible paths of radio waves that permit long-distance radio communication (not drawn to scale)





the U.S. Iowa's industry is widespread and includes the largest washing-machine industry, the largest aluminum-sheet rolling mill, and the largest cellophane and cereal plants in the country.

Iowa is bounded on the N. by Minnesota, on the E. by Wisconsin and Illinois, on the S. by Missouri, and on the W. by Nebraska and South Dakota. It ranks 25th in size among the states and 24th in population, according to the 1960 Decennial Census of Population (the District of Columbia included in both rankings). The state's name is believed to have come either from the name of an Indian tribe or from Indian words meaning "This is the place." The state's nicknames are the "Hawkeye State," for a character in James Fenimore Cooper's "The Last of the Mohicans"; and the "Corn State."

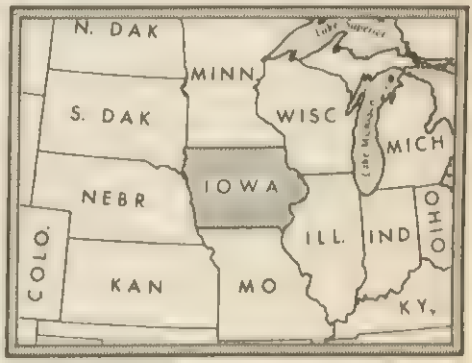
Geography

Iowa's eastern boundary is the Mississippi River, its western boundary, the Missouri and Big Sioux rivers. Between these, the Des Moines River flows from northwest to southeast, dividing the state into almost equal halves and joining the Mississippi at the southern border. Other rivers flowing into the Mississippi are the Iowa, the Skunk, and the Cedar. Western rivers, including the Big Sioux, Little Sioux, Floyd, and Mishnabotna, flow into the Missouri River.

Location	Between 89°5′ and 96°31′ W. long. and 40°36′ and 43°30′ N. lat.
Area	56,290 sq. m
Land	56,032 sq. m
Inland water	258 sq. m
Greatest extent:	
North to south	217 m
East to west	314 m
Population (1960)	2,757,537
Capital city	Des Moines
Highest point	Osceola County (1,675 ft.)
Lowest point	Mississippi River (480 ft.)
Admitted to the Union (29th state)	1846
Song	"Iowa," words and music by S. H. M. Byers
Flower	Wild rose
Bird	Eastern goldfinch
Motto	"Our Liberties We Prize, and Our Rights We Will Maintain"
Flag	See color plate in Vol. XI

The land of Iowa is a rolling prairie, with hills and woodlands, almost all of which is devoted to some form of agriculture. In the northern section along the Mississippi, and along the Missouri just south of the Big Sioux, are cliffs or bluffs rising to a few hundred feet. Except for these and some low valleys, most of the state is laid out in a patchwork of cultivated fields.

The principal lake region lies in the north, near the Minnesota border, toward the western part of the state. Important lakes include East



and West Okoboji, Spirit, Storm, and Clear lakes.

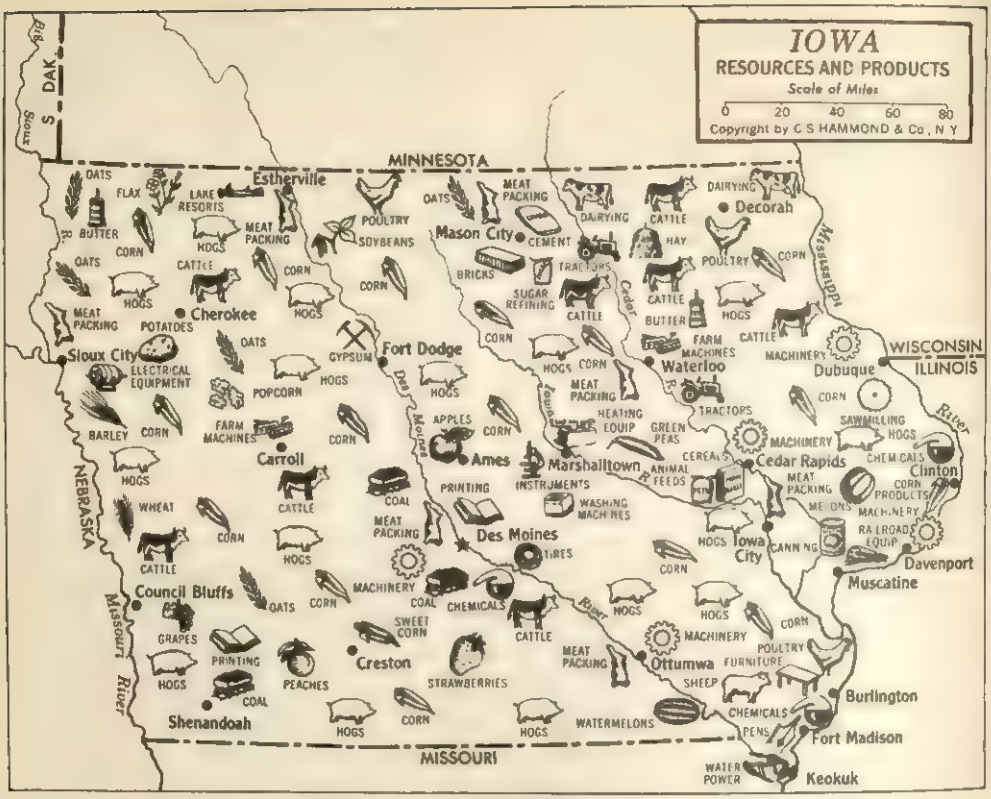
Iowa's soil is dark, heavy, extremely fertile, and well watered by the many rivers, streams, and lakes. It is reported that one-fourth of all the grade-one land in the U.S. is in Iowa.

Climate: Iowa has a continental climate, which varies little throughout the state but has marked seasonal variations. Winters are cold, usually with heavy snowfall. Summers are hot, with frequent thunderstorms and occasional tornadoes. Rainfall is ample for agriculture, with the greatest quantity occurring during the summer.

Normal temperature, Des Moines	
January	22.8° F.
July	77.1° F.
Annual mean	50.9° F.
Latest frost, Des Moines	May 11
Earliest frost, Des Moines	Sept. 28
Precipitation, Des Moines	
January	1.22 in.
July	2.96 in.
Annual	30.89 in.
Average growing season, Des Moines	175 days

Natural Resources

By far the greatest of Iowa's natural resources is its land. The rich soil, so suitable for the cultivation of corn, oats, wheat, and other crops,



as well as for the grazing of livestock, is the resource on which the growth and basic economy of the state rests. Besides farm land, there are 2,510,000 acres of forest land in Iowa, and the state has live sawtimber amounting to the total of 4,119,000,000 bd. ft.

Deposits of clay exist in almost all counties in Iowa, giving rise to a growing brick-and-tile industry. Metallic minerals are scarce in the state, but sand, gravel, and limestone are plentiful. Iowa is the nation's third-largest producer of gypsum, important deposits existing at Ft. Dodge and in the extreme southeast. Coal deposits are plentiful, one large area existing in the west central section along the Des Moines River, from Webster County southward. At the present rate of consumption, it is estimated that Iowa has a 10,000-year supply of coal.

The state is well supplied with water by its two major rivers, the Mississippi and the Missouri, plus its interior rivers, streams, and lakes. The growth of towns and industries, however, and the resultant river pollution, have necessitated purification and conservation programs. Other state conservation activities include parks, artificial lakes, reforestation, and flood control. The state has developed some hydroelectric power.

ANNUAL STATE EVENTS

Drake Univ. Relays	April; Des Moines; track and field competition
Pella Tulip Festival	May; Pella; festival featuring Dutch costume
Tulip Festival	May; Orange City
Indian Powwow	late summer; Tama; Indian dances
Iowa State Fair	last week in August; Des Moines

Iowa's Economy

At the time of the 1960 census, Iowa had an employed population of 1,019,002. Of this total, 21 per cent were in agriculture, forestry, and fisheries; 19 per cent in manufacturing; 5 per cent in construction; and 0.2 per cent in mining. The remainder were employed in the wholesale and retail trades, in government, and in supplying personal, professional, and other services.

There were 147,707 farms in 1959, occupying a total of 33,831,000 acres. The average farm had 194 acres, with land and buildings valued at $49,150.

Iowa is one of the highest-ranking states in the value of its agricultural products. It is the leading U.S. producer of livestock and livestock products. Sales of cattle, calves, and hogs for meat account for the greatest part of farm marketing receipts, although milk and butterfat, eggs, turkeys, and sheep and lambs are also significant sources of income.

Animal feeds, particularly corn, are the most important crops, and the state is also a leading

national producer of soybeans. In 1961 receipts from marketing of livestock, livestock products, and crops totaled $2,541,841,000.

Foodstuffs, particularly meat and grain products, are the most important manufacture of Iowa. Other major manufactures include nonelectrical machinery, particularly farm machinery; household appliances and other electrical machinery; chemicals; and fabricated metal products. The state's value added by manufacture in 1961 was $1,848,966,000.

Iowa's mineral output was valued at $90,674,000 in 1961, comprising less than 1 per cent of the total U.S. value and placing the state 30th among the states. The principal minerals, in order of production value, were cement, stone, sand and gravel, and gypsum.

Transportation and Communication

Iowa's total road mileage in 1960 was 111,671 m. The railroad mileage throughout Iowa in the same year totaled 8,561 m. Because of its geographic location, the state is served by a number of railroads. The first railroad to operate in the state was the Mississippi and Missouri R.R. (1855), now a part of the Chicago, Rock Island and Pacific R.R. Other railroads include the Union Pacific R.R., the Atchison, Topeka and Santa Fe Ry., the Chicago and North Western Ry., and the Chicago, Milwaukee, St. Paul and Pacific R.R. There are airfields in leading cities throughout the state. In 1961 there were 71 radio stations and 12 television channels in the state. The first newspaper in the state was the Dubuque *Visitor* (1836), no longer extant. Among today's leading papers are the Des Moines *Register* and *Tribune*.

Population

Iowa has 99 counties. The 1960 census population was 2,757,537 (1962 est. population, 2,777,000), an increase of 5.2 per cent over 1950. The urban population comprised 1,462,512, or 53 per cent; the rural population 1,295,025, or 47 per cent. Between 1950 and 1960 the urban population rose 16.9 per cent; the rural population decreased (for the sixth successive decade) by 5.5 per cent. Almost 57 per cent of the 1960 urban population lived in the urbanized areas of Des Moines, Davenport-Rock Island-Moline, Cedar Rapids, Waterloo, Sioux City, and Dubuque. In 1960 white persons numbered 2,728,709; of the 28,828 nonwhites, 25,354 were Negroes, 1,708 were Indians, and the remainder included Japanese, Chinese, Filipinos, and others. Iowa's native-born residents totaled 2,701,259; the foreign-born, 56,278. The population density in 1960 averaged 49.2 per sq. m.

DAIRY FARM IN IOWA

A typical scene in the northeastern part of the state, which is the nation's foremost producer of livestock and other agricultural products

LIFE IN THE HAWKEYE STATE

The largest cereal plant in the U.S. (*top left*), in Cedar Rapids, is owned by the Quaker Oats Co. One of the dozen or so covered bridges (*above*) still remaining in Iowa arouses nostalgia for the old days. A meat-processing plant (*center left*) in the middle of a cornfield is characteristic of Iowa "where factory and farm share prosperity." The Little Brown Church in the Vale (*bottom left*), near Nashua, was built in 1864. It was named after the well-known hymn by William S. Pitts. A breath-taking view of the Mississippi River (*below*) at Pike's Peak, near McGregor, is one of the state's many scenic attractions (*courtesy Iowa Development Commission*)

The major religious bodies are the American Baptist Convention; the Christian Churches, International Convention (Disciples of Christ); the Evangelical United Brethren Church; the Lutheran Church in America; the Lutheran Church—Missouri Synod; The Methodist Church; the Protestant Episcopal Church in the U.S.A.; the Roman Catholic Church; the United Church of Christ; and The United Presbyterian Church in the U.S.A.

Chief Cities: Des Moines, the capital and largest city, in south central Iowa, is an industrial center and the seat of Drake Univ.

Cedar Rapids, on the Cedar River, second-largest city in the state, has foundries and plants manufacturing machinery and equipment.

Sioux City, on the Missouri River in western Iowa, is the third-largest city and the center of a meat-packing industry.

Davenport, in eastern Iowa on the Mississippi River, is the fourth-largest city; its manufactures include machinery.

Famous Men and Women: Catt, Carrie Chapman (1859-1947), Wisconsin-born suffragist and educator.

Cody, William Frederick (Buffalo Bill), (1846-1917), plainsman, buffalo hunter, and organizer of Buffalo Bill's Wild West Show.

DeForest, Lee (1873-1961), inventor who made vast contributions to the development of wireless telegraphy and related fields.

Dubuque, Julien (1762-1810), pioneer settler, for whom the city of Dubuque was named.

Gallup, George Horace (1901-), originator of the Gallup Poll, a survey of public opinion.

Glaspell, Susan (1882-1948), playwright; "Alison's House," her dramatization of Emily Dickinson's life, won the Pulitzer Prize in 1931.

Hoover, Herbert Clark (1874-), 31st President of the U.S. (1929-33).

Leahy, William Daniel (1875-1959), admiral of the fleet, who was chief of naval operations (1937-39).

Lewis, John Llewellyn (1880-), labor leader, president of the United Mine Workers of America (1920-60).

Miller, Samuel Freeman (1816-90), lawyer, Associate Justice of the U.S. Supreme Court (1862-90).

Russell, Lillian (1861-1922), famous beauty, actress, and singer.

Suckow, Ruth (1892-1960), author of novels set in Iowa.

Sunday, William Ashley (Billy), (1863-1935), evangelist and strong prohibitionist.

Wallace, Henry Agard (1888-), Vice President of the U.S. (1941-45) and Progressive party candidate for the Presidency in 1948.

Wood, Grant (1892-1942), painter, who was noted for his treatment of Midwestern scenes.

Education

Education is free and compulsory for children between the ages of seven and 16. The state's public-school system was established *ca.* 1850. Public-school enrollment totaled 597,838 in 1962. There were an additional 89,093 enrolled in Roman Catholic parochial schools in the same year. The leading state-supported institutions of higher learning include the State Univ. of Iowa, Iowa City, and Iowa State Univ. of Science and Technology, Ames. Among private colleges and universities are Drake Univ., Des Moines; Grinnell Coll., Grinnell; and Iowa Wesleyan Coll., Mt. Pleasant.

Cultural institutions include the Davenport Municipal Art Gallery; the Blanden Memorial Gallery, Ft. Dodge; and the Little Gallery, Cedar Rapids. Archaeological collections are maintained at the State Historical Society, Iowa City; the Davenport Museum; the Herrmann Museum, Dubuque; the State Historical, Memorial, and Art Bldg., Des Moines; and the Frank E. Ellis Museum, Maquoketa.

Government

The state is governed under provisions of a constitution adopted in 1857 and frequently amended. The constitution gives executive authority to a governor, lieutenant governor, secretary of state, attorney general, treasurer, auditor, and controller, each elected for a term of two years. The legislature consists of a senate of 50 members, elected for four-year terms, and a house of representatives of 108 members, elected for two-year terms. The legislature meets in Des Moines, the capital city, for regular sessions on the second Monday in January of the odd-numbered years. The length of the regular session is three months. The supreme court consists of a chief justice and eight associate justices elected for six-year terms. The judicial system also includes a superior court with judges elected for four years, 21 district courts, and nine municipal courts. The state is represented in the U.S. congress by two Senators and seven Representatives.

History

Iowa was inhabited in prehistoric times by Indians called Mound Builders. Their mounds are scattered throughout the state. The Indians living in Iowa at the time of white settlement are believed to have descended from the Mound Builders. Two groups of tribes were represented: the Sioux, migrating from the east and north; and the Algonquian, from the north and west. The Sioux included the Iowa, the Oto, the Missouri, and the Omaha tribes; the Algonquian included the Sac, the Fox, the Potawatomi, and the Mascouten tribes. These tribes warred

MAJOR RECREATIONAL AND HISTORIC FEATURES

Name and Type	Size and Location	Points of Interest
Effigy Mounds National Monument (established 1949)	1,476 acres in the northeast, near McGregor (state 13)	Indian mounds shaped like birds and animals
Backbone State Park (established 1919)	1,411 acres in the northeast, in Delaware County (state 3, 13, 19)	Unusual geological formations; swimming, camping
Lacey-Keosauqua State Park (established 1919)	2,256 acres in the southeast, in Van Buren County (off state 1)	Scenic recreation area, swimming, camping
Ledges State Park (established 1920)	860 acres in central Iowa, in Boone County (off U.S. 30, state 164)	Scenic natural preserve; camping
Waubonsie State Park (established 1926)	816 acres in the southwest, in Fremont County (off U.S. 275; state 2, 239)	Loess hills; unusual botanic features; camping, hiking
Ft. Atkinson State Monument (established 1921)	5 acres in the northeast, near Decorah (U.S. 52, state 24)	Federal fort built (1840) to protect the Winnebago Indians from their enemies, the Sioux, Fox, and Sac tribes
Iowa Great Lakes	100 acres of state parks, 12,000 acres of fresh water in the northwest (U.S. 71; state 9, 32)	Five lakes, including East and West Okoboji and Spirit Lakes; Gardner Sharp Cabin, scene of Indian massacre (1857); Arnold Park, with Spirit Lake Indian Massacre monument
Covered Bridges	Madison, Marion, and Keokuk counties	Pre-Civil War oak and white-pine bridges, many still in use
Herbert C. Hoover's Birthplace	West Branch, near Iowa City (state 1)	Birthplace of former President; park, picnic area
Amana Colonies	Amana, southwest of Cedar Rapids (U.S. 6; state 149, 220)	Communal villages founded by members of the Amana religious sect; dating to 1855
Tama Indian Reservation	Near Tama (off U.S. 30, 63)	Land set aside, beginning in 1857, for Fox Indians
Little Switzerland	Around Decorah (U.S. 52; state 9)	Chimney Rocks, Wonder Cave, Ice Cave, Siewers Springs; Scandinavian museum in Decorah

among themselves before white settlement began.

In the late 17th century, when the entire unexplored northwest was a French possession, the area that is now Iowa was first visited by Louis Joliet, a French-Canadian fur trapper, and Father Jacques Marquette, in 1683. Less than 100 years later, lead was discovered in the northeastern part of the area, and settlers began to move in. Among the early arrivals was Julien Dubuque, a fur trader, the first white man to establish a home in Iowa. In 1788 Dubuque developed friendly relations with the Indians and obtained permission from them to work lead mines. He settled near the present city of Dubuque and in 1796 received a Spanish grant of the land and mines. The fur-trapping trade flourished. Included in the Louisiana Purchase (1803), Iowa became part of the Missouri Territory in 1812. The area was still unorganized after 1821, when Missouri became a state, and the settlers tried to govern themselves. Dubuque was founded in 1833, and Davenport, in 1836. Iowa became part of the Michigan Territory in 1834 and of the Wisconsin Territory in 1836. It received individual territorial status in 1838, with Robert Lucas as the first governor. Meanwhile, settlement progressed rapidly, with farmers and millers pouring in. Statehood was achieved in 1846, by which time word of Iowa's rich soil had spread and European settlers, including Germans, Scandinavians, and Dutch, had begun to arrive.

During the Civil War, the state contributed many men to the Union forces. The postwar period saw a reversal of agricultural prosperity, and many Iowa farmers sought solutions through political activity such as the Grange movement (an outgrowth of the National Grange of the Patrons of Husbandry, which promoted corrective legislation and encouraged the establishment of farm co-operatives) and the Greenback party (which sought to expand the currency in the hope that inflation would ease the burden of debt contracted by the farmers during the wartime boom). Some remedial legislation was achieved, notably the Grange laws (1874), regulating railroad rates. During the early 20th century, prosperity returned to Iowa's farms, and industry made significant advances in the state. In World War I, Iowa contributed 114,404 men to the armed forces. During World War II, the state's productive capacity was increased both in industry and agriculture. A total of 276,131 Iowans served in the armed forces during the latter conflict. In the postwar years, the state's rate of industrial growth has exceeded that of the nation as a whole, while its farm income has been maintained at a level second only to that of California. With economic growth encouraged throughout the state, Iowa's industrial output especially has consistently increased in value, surpassing the value of its outstanding farm production.

See also separate entries on most of the individuals and geographical and historical subjects mentioned in this article.

Iowa, UNIVERSITY OF, a coeducational state institution of higher learning at Iowa City, Iowa, founded in 1847 and reorganized in 1860. It heads the Iowa public-school system. It comprises the colleges of business administration, liberal arts, dentistry, engineering, journalism, law, medicine, music, nursing, pharmacy, social work, and teacher education, and the graduate college. The libraries have some 1,350,000 volumes and gov-

ernment documents. The annual student enrollment totals *ca.* 12,000, and there are *ca.* 700 members of the faculty. The physical plant is valued at *ca.* $60,000,000.

Iowa City, a city in southeast central Iowa, seat of Johnson County, on the Iowa River, 51 m. N.W. of Davenport. It is on the Chicago, Rock Island and Pacific R.R. and Cedar Rapids and Iowa City Ry. There are manufactures of drugs and printing products. The city had a value added by manufacture, 1958, of $24,549,000. Iowa City is the site of the Univ. of Iowa and the state tuberculosis sanatorium. The villages of the Amana Community (*q.v.*) are nearby. Iowa City was the capital of Iowa Territory until 1846, and of the state until 1857. It was chartered in 1853. Population, 1960, 33,443.

Iowa Indians, a tribe of Siouan linguistic stock of the Chiwere subdivision which also included the Oto and Missouri. Their traditional habitat was in southern Wisconsin, but when the first Europeans met them they were located for the most part in Iowa, where they did considerable moving about. In the 19th century some of the Iowa established themselves along the Grand and Platte rivers in Missouri. The latter did extensive bartering in skins of beaver, raccoon, otter, deer, and bear with traders coming up the river from St. Louis. They also cultivated corn, beans, and other vegetables. By a series of treaties they surrendered their claims to all lands in Minnesota, Iowa, and Missouri. In 1836 they moved to a reservation in Kansas and Nebraska. Subsequently, some of them moved to a reservation in Oklahoma. Most of the Iowa are now of mixed blood. About 540 live on the Kansas-Nebraska reservation, while there are some 100 in Oklahoma.

Iowa State University of Science and Technology, a coeducational, land-grant state institution of higher learning at Ames, Iowa, founded in 1858. It includes colleges of architecture, chemistry, engineering, graduate study, home economics, sciences and humanities, and veterinary medicine. A major laboratory of the U.S. Atomic Energy Commission is located at the university. The library, noted especially for its collection of scientific periodicals, contains [illegible] volumes. Student enrollment [illegible] and there are some 1,900 members of the faculty. The physical plant of the university is estimated at a value in excess of $[illegible]

Ipecacuanha (*ip'i·kăk·ū·ăn'ă*), a South American plant (*Cephaelis ipecacuanha*), found chiefly in moist and shady woods. It is a shrub, [illegible] near the ends of the branches, [illegible] small white flowers. The fruit is a [illegible] berry. The plant is valuable for its root, from which a medicinal substance known as ipecacuanha is obtained. This product has a bitter taste, is mildly irritant, and is commonly known as *ipecac*.

Iphigenia (*ĭf·ĭ·jē·nī'ă*), in Greek legend, the daughter of Agamemnon and Clytemnestra and sister of Orestes and Electra. Because Agamemnon had offended Artemis the goddess, becalmed his ships, which were to sail against Troy, at Aulis. To appease her, he offered Iphigenia as a sacrifice. Artemis carried the girl off to Tauris and made her a priestess in a temple where all strangers were killed. When Orestes came to steal the sacred image of the goddess, Iphigenia recognized him, saved his life, and fled with him to Attica. The story of Iphigenia has been a favorite subject for dramatic poetry. She was the subject of tragedies by Euripides, Goethe, and Racine, and Gluck composed an opera about her.

Ipswich (*ip'swĭch*), a town in northeastern Massachusetts, at the mouth of the Ipswich River in Essex County, 28 m. N.E. of Boston. It is served by the Boston & Maine R.R. and has manufactures of electrical equipment. The Ipswich clams are famous for their flavor and texture. Settled in 1633, the town was first called Agawam; it was incorporated as Ipswich in 1634 and still contains a number of 17th-century buildings. Anne Bradstreet (*q.v.*) was one of its early residents. Population, 1960, 4,[illegible]

Ipswich, a county borough and seaport of southeastern England, the county seat of East Suffolk, 69 m. N.E. of London. Situated on the estuary of the Orwell River, it is [illegible] from the North Sea. Manufactures include [illegible] machinery, agricultural tools, fertilizers, [illegible] and falvics. Shipbuilding is an extensive enterprise. The town is very old; traces of a Roman villa and of an early Saxon settlement have been found. Ipswich was sacked by Viking raiders in 991. Among its notable buildings are a 15th-century school, several fine churches, and a number of Elizabethan houses. Cardinal Wolsey was a native of Ipswich, and Thomas Gainsborough lived here. Population, 1961, 117,325.

I.Q. or **IQ.** See *Intelligence Test.*

Iran (*ē·rän'*), a kingdom in southwestern Asia, bounded on the N. by the U.S.S.R. and the Caspian Sea, on the E. by Afghanistan and Pakistan, on the S. by the Gulf of Oman and the Persian Gulf, and on the W. by Iraq and Turkey. Until 1935 Iran was officially called Persia, and it is still often referred to by that name.

Physical Features. Iran is mostly a highland country with a number of lofty mountain ranges and high plateaus. Much of it is desert and only about 5 per cent of the total area of 628,000 sq. m. is under cultivation. The upland climate is continental, with hot, dry summers and cold winters; along the coasts of the north and southwest it is subtropical, with very hot summers

RICE CULTIVATION IN THE LOWLANDS OF THE CASPIAN SEACOAST
Rice is the chief item of food exported by Iran

Population, Language, and Religion. The people of Iran are mostly Persian-speaking Iranians; there are minority groups of Turks, Kurds, and Armenians. Mohammedanism is the prevailing religion. The capital is Teheran (population, 1949, 680,000), and other cities include Tabriz, Isfahan, Meshed, Hamadan, and Resht; Abadan is the chief petroleum center. In 1951 the total population was estimated at 19,139,563.

Resources and Trade. Irrigation agriculture is the principal occupation; rice, sugar cane, cotton, flax, tea, citrus fruits, dates, cereal grains, and vegetables are the principal crops. Goats and sheep are the chief livestock. Leading manufactures are textiles, carpets, firearms, and leather goods. Iran's most valuable natural resource is petroleum, of which the country is the largest producer in the Middle East and the fourth largest in the world. The chief Iranian oil fields are in the southwest region at the head of the Persian Gulf. Other mineral resources include iron, copper, lead, manganese, borax, nickel, cobalt, and turquoise. Iran has about 1,095 m. of railroads and 1,043 m. of hard-surfaced highways. There is an international airport at Teheran.

Education. Primary education is free and compulsory. There are universities at Teheran and Tabriz, with a combined enrollment in 1949 of 5,919.

Government. A constitutional monarchy, Iran is ruled by a Shah (incumbent, Mohammed Riza Pahlavi). The people are represented by a national assembly, the Majlis, with members elected once in two years. A senate, provided for by the constitution of 1906, was established in 1950. The shah is empowered to dissolve the assembly whenever he deems it necessary. The executive branch of the government consists of a premier and a cabinet responsible to the assembly. The unit of currency is the rial (see *Coinage*).

Military service for two years is compulsory. Iran's peacetime army numbers about 130,000 men and officers. The country also has a small navy and air force.

History. For the history of Iran before the official restoration of the name Iran in 1935, see *Persia*. In World War II Russia and Great Britain occupied Iran to prevent it from falling under German control, forcing the abdication of the king, Shah Riza Pahlavi, in 1941 and the succession of his son, Mohammed Riza Pahlavi. In 1942 a U.S. Persian Gulf Command was established in Iran as the country became an important route for American Lend-Lease aid to the Soviet Union. In 1943 Teheran was the site of the famous conference of Franklin D. Roosevelt, Winston Churchill, and Joseph Stalin to discuss prosecution of the war. The three statesmen took the occasion to pledge the territorial integrity, independence, and sovereignty of Iran.

When the war ended, Iran was troubled by a movement for autonomy in Azerbaijan province and the Soviet Union's refusal to withdraw its troops in accordance with treaty obligations. A charter member of the U.N., Iran took the dispute before the Security Council; it was the first major case acted upon by the international body. The discussions led to the evacuation of Russian forces in 1946, with Teheran retaining control over Azerbaijan. The pro-Soviet Tudeh party was outlawed in February 1949, after an unsuccessful attempt on the Shah's life.

In an upsurge of nationalism, Iran sought a larger share of the revenues of the Anglo-Iranian Oil Co., concessionaire of Iran's vast oil resources. Negotiations with the company, controlled and partly owned by the British government, proved difficult and protracted amidst the increasing turbulence of Iranian political life. In March 1951 the assassination of Premier Ali Razmara brought to power Mohammed Mossadegh, who immediately won passage of legislation nationalizing the oil industry. With the two parties unable to agree on compensation, the British withdrew from the oil installations and imposed an effective blockade on the movement and sale of Iranian petroleum. Premier Mossadegh personally pleaded his country's case when the dispute was carried before the U.N. Security Council and the International Court of Justice; but neither these steps nor active U.S. mediation produced a solution. With the Iranian economy weakened by lack of oil revenues, Dr. Mossadegh clashed with the Shah in August 1953, during a series of riots in

the capital. Mossadegh first forced the Shah's withdrawal from the country, but then was ousted with the help of the army, and the Shah was recalled; and Gen. Fazlollah Zahedi was installed as the new premier. By the end of 1953 Mossadegh had been sentenced to prison for treason, and negotiations for marketing Iranian oil were renewed in 1954.

Iranians (*i-rā′ni-ənz*) or PERSIANS, a people belonging to the Aryan or Indo-European family. They are so named from Iran, the native name of Persia. The Medes, mentioned as early as 2400 B.C., are the first of these people of whom there is historic record. Both the Medes and the Persians were highly advanced in civilization at an early date. The Iranian language may be divided into three general groups: the Old Persian cuneiform inscriptions; the Zend, or Old Bactrian, the language in which the sacred writings of the Parsees are written; and the Middle Iranian, or Pehlevi, languages, in which the Zend-Avesta commentaries are preserved. The modern Persian is Iranic, but it contains many Arabic words. In this language a number of celebrated masterpieces of literature were produced. The modern Iranians inhabit regions west of the Indus River. Among them are the Kurds, Ossetians, Baluchis, Afghans, Tajkis, and Persians.

Iraq (*i̇-räk′*) or IRAK, a kingdom of southwestern Asia, bounded on the N. by Turkey; on the E. by Iran; on the S. by the Persian Gulf, Kuwait, and Saudi Arabia, and on the W. by Hashemite Jordan and Syria.

PHYSICAL FEATURES. The central part of the country, lying between the Tigris and Euphrates rivers, is a level plain with naturally fertile soil which is unproductive unless irrigated. To the west and southwest there is a wide desert region, part of the Syrian Desert, while the north and northeast are mountainous. Except in the mountains of the extreme north, Iraq has a desert climate, with little rainfall. It has a total area of 171,600 sq. m., of which 116,000 sq. m. are habitable.

RESOURCES AND TRADE. Agriculture is the chief occupation. More than three-fourths of the world's date crop is grown in Iraq. Other crops are tobacco, cotton, millet, wheat, rice, hemp, and opium. The raising of camels, sheep, goats, and cattle is an important livelihood. Since 1927 the development of Iraq's oil resources in the north and northeast has been a crucial factor in the nation's economy and has provided the government with sizable revenues. There are about 1,055 m. of railroads and 4,750 m. of roads.

POPULATION, LANGUAGE, AND RELIGION. The people of Iraq are for the most part Arabic-speaking Moslems; there are small Christian and Jewish minorities. Bagdad is the capital (population, 1955, 882,907), and Basra the chief port

IRANIAN OIL DRILLING

The Iranian oil fields normally produce some 650,000 bbl. per day

(327,593 in 1957); other important cities are Mosul, Kirkuk, and Karbala. In 1957 the total population was estimated at 4,859,000.

EDUCATION. Education is free and compulsory for children between 6 and 12. There is no university, but there are six colleges, with an enrollment in 1951 of 5,000.

GOVERNMENT. Iraq was a limited monarchy (last king, Faisal II) until July 14, 1958, when the government was overthrown and a republic proclaimed. Under provisions of a temporary constitution, power was assumed by a council of sovereignty in place of a president; executive and legislative powers are vested in a prime minister and a council of ministers.

The currency unit is the dinar (see *Coin*).

HISTORY. The central part of Iraq, between the Tigris and the Euphrates rivers, was the ancient Mesopotamia, and archaeological excavations in the area have revealed traces of some of the world's earliest civilizations. The empires of Assyria, Babylonia, and Chaldea flourished here, and such ancient cities as Ur, Ninevah, and Babylon were located in this region. After the fall of the Persian empire (331 B.C.), Mesopotamia was held successively by the Greeks under Alexander the Great, the Romans, and the Arabs. In 1258 the country was devastated, and its irrigation system wrecked by Mongol invaders. Mesopotamia never fully recovered from this in-

vasion, and in the 16th century it fell under the domination of the Ottoman Turks. Under the Turks it was a neglected outpost exploited by Turkish officials.

In 1915 British forces occupied Iraq, removing it from Turkish control. Gradually, Iraqi nationalism increased, but a revolt against the British in 1920 was unsuccessful. By the Treaty of Sèvres (1920), Iraq became a mandate of the League of Nations under British administration. In 1921 a kingdom was established, but the country did not obtain independence until 1932, when it was also admitted to the League of Nations. Ghazi I reigned as king from 1933 to 1939, when he was succeeded by Faisal II (assassinated in 1958). Early in 1941 a pro-Nazi regime was ousted by the British, and in 1943 Iraq entered World War II on the side of the Allies.

During the postwar period, Iraq has played a key role in Middle Eastern affairs. In 1945 it joined with other Arab nations to form the Arab League (*q.v.*) and opposed the establishment of the state of Israel (*q.v.*). With the tenure of Nuri as-Said as prime minister (1954-57), Iraq became increasingly pro-Western in its international relations. In 1955 it joined with Turkey, Great Britain, Pakistan, and Iran in the Bagdad Pact, a military defense treaty covering much of the Middle East area. In 1958 Iraq joined with Jordan to form the Arab Union (*q.v.*), in an agreement which unified the external, financial, and military policies of the two countries, but a military junta that took office in July withdrew from the union, which was subsequently dissolved.

Irawadi (*ĭr'ə-wŏd'ĭ*). See *Irrawaddy*.

Ireland (*ĭr'lənd*), an island in the Atlantic Ocean, embracing the Republic of Ireland (formerly Eire) and Northern Ireland, which is a political unit of the United Kingdom. The island lies about 60 m. w. of Great Britain, from which it is separated by St. George's Channel and the Irish Sea. It is bounded on the s., w., and N. by the Atlantic Ocean, and on the N.E. by the North Channel, which separates it from Scotland. The greatest length, measured from Fair Head in the northeast to Mizen Head in the southwest, is 304 m. Its breadth varies considerably, being about 110 m. through the central part, between the Bays of Galway and Dublin, and 210 m. from Benwee Head in the northwest to Carnsore Point in the southeast. Including over 400 sq. m. of water surface, the island comprises 32,375 sq. m. Of this total, 27,137 sq. m. are in the Republic of Ireland, and 5,238 sq. m. in Northern Ireland.

Description. The surface is diversified, including large tracts of undulating districts and elevated ranges with hills and mountains, the greatest height being *ca.* 3,500 ft. Mount Carrantual, a peak of the Macgillicuddy's Reeks, in the southwestern part, has an elevation of 3,414 ft. In the southeastern part are the mountains of Wicklow, rising about 2,750 ft. above the sea. The coast varies from gradual elevations to precipitous heights, but the general surface may be described as basin-shaped, the interior being a vast plain with extensive tracts of bogs and lakes. There are numerous islands along the west shore, of which Clare and Achill are the most important. Many excellent harbors are furnished by coastal indentations, and the entire coast line, including the inlets, has a length of 3,000 m. The principal inlets are the Bays of Donegal, Galway, Dingle, Bantry, and Dundalk. Lough Foyle is an important inlet on the north coast.

An irregular line drawn from Lough Foyle in the north to Mizen Head in the southwest marks the dividing line from which the rivers radiate, but the divide is not distinguished by striking surface features. Many of the streams widen into long lakes or loughs, owing to the fact that rainfall is abundant and the slopes are gradual. The Shannon, in the west, about 200 m. long, is the largest river in Ireland. About half of it above the estuary is made up of the three lakes Derg, Ree, and Allen. In the north is the Erne River, which drains a part of the central plain and flows into Donegal Bay. The Boyne, rising in the central plain, is not made up of lakes. In the south is Waterford Harbor, into which flow the Suir and Barrow Rivers. Other streams having a southward course include the Lee, the Bandon, and the Blackwater. The inland lakes include Lough Derg, Lough Ree, Lough Mass, Lough Neagh, and Lough Erne.

The climate of Ireland is greatly modified by the westerly winds blowing from the Atlantic Ocean, where they are tempered by passing over its comparatively warm surface. From this circumstance the climate is milder and more equable than that of England, and the mean winter temperature is 25° higher than that of the same latitude in the Atlantic region of America. Though it has the advantage of a moderate temperature and ample rainfall, the disadvantages of damp winds and heavy fogs are felt in nearly all parts of the island, but particularly along the west and south coasts. In the interior, the atmosphere is somewhat drier, the rainfall being about 35 in., while the wetter districts have a rainfall of 42 in. The climate and soil give the island a characteristic garb of rich green vegetation, from which was derived its nickname of "Emerald Isle." Animal life is limited in both number and diversity of species.

Mining. Though Ireland has valuable deposits of iron ore, this mineral is not worked extensively, owing to the absence of large deposits of coal. Most of this product is obtained in Antrim County. A limited supply of anthracite coal

exists, but the coal measures consist chiefly of an inferior grade of bituminous coal. Other minerals found in varying quantities, chiefly in the north, are sandstone, limestone, granite, alum, slate, salt, and lead.

Agriculture. In both parts of Ireland, agriculture is by far the leading industry. Though the arable surface is rich in having a productive soil, large districts are made up of moorland. Under the conditions prevailing in the 12th century when Ireland was organized as an English possession, the land was give in large tracts to prominent nobles. The resulting condition of farm tenantry and absentee ownership has probably contributed more than any other factor to retarding Irish development. It was not until relatively recent years that any large movement was instituted to correct this condition. In the latter part of the 19th century the government adopted a policy to enable the peasants to purchase land, under which money was advanced for that purpose, and the peasants were permitted to repay by remitting annual installments. This resulted in dividing many of the larger estates, and the process was continued with increasing vigor after the separation of the country from England. In addition to buying out the larger tracts, the various land purchase acts aimed at reclaiming unused areas for agriculture. The methods of farming are improving, and much of the land has been redeemed by drainage and enriched by fertilizers.

A large percentage of the land is in pasture, and the very considerable livestock industry requires about 20 per cent of the cultivated acreage to be devoted to hay. About a third as much land is given to raising oats. Other crops grown extensively include potatoes, turnips, barley, beet roots, and wheat. Flax is grown chiefly in the northern part. Vegetables and small fruits are abundant in all sections of the island. Cattle raising is the principal livestock industry, and the interests in dairying and in meat production are about equal. Sheep are grown chiefly in the highlands, where the grasses and climatic conditions are peculiarly favorable. Poultry raising is carried on almost universally among the peasants. Other domestic animals include horses, mules, swine, and goats.

Manufactures and Commerce. The manufacturing industries are not important, when compared to the resources. A large proportion of the livestock of the Republic of Ireland is shipped to Great Britain, with Northern Ireland as the second largest consumer. Linen and woolen textiles are the principal manufactures of Northern Ireland. Belfast has been noted as a center for linen textiles for several centuries. Ulster is a center of manufacture of woolen and worsted goods. Large shipyards are located at Belfast and Londonderry in Northern Ireland.

The industrial production of the Republic of Ireland consists almost entirely of food processing, in addition to some shipbuilding. Other manufactures include machinery, clothing, embroidery, lace, leather, and liquors. Considerable material for the manufacturing industry is supplied by the fisheries, which yield large catches of cod, herring, pilchard, and salmon. In recent years a large number of new industries, catering to the needs of the home market, have been successfully established.

The chief exports are livestock, grain, fish, whisky, and dairy products, while the imports include wheat, corn, flax, tea, tobacco, and machinery. Other countries which figure prominently in the trade of Ireland (especially of the Republic of Ireland), are the United States, Russia, Canada, Australia, and Argentina.

Population: Most of the inhabitants of Ireland are of Celtic origin, and this remains the predominant national strain although largely mixed with a variety of immigrant groups. Early settlers, especially from England, amalgamated completely with the native peoples. In Northern Ireland, on the other hand, English and Scottish colonists have tended to maintain their separate identities.

The chief urban centers of population are Dublin, capital and largest city of the republic, located on Dublin Bay; Cork, Limerick, and Waterford. In Northern Ireland, Belfast is the capital and largest city with the port of Londonderry ranking next in importance. The population of Ireland as a whole has decreased materially in recent times due chiefly to emigration. In 1841 the island had a population of 8,196,597; 60 years later, in 1901, it had fallen to 4,458,775. In 1921 the population was 4,381,951; in 1931 it was 4,485,000. The combined population of the Republic of Ireland and Northern Ireland by latest counts was 4,265,743. Of this figure, 2,894,822 lived in the Republic of Ireland (1956 census) and 1,370,921 in Northern Ireland (1951 census).

Language and Literature. The Irish language is a branch of the Celtic and belongs to the Gaelic, being allied to the Manx and Scotch Gaelic, and to the Celtic dialects known as Cornish, Welsh, and Armoric. Although the language had great historical importance, and was rich in literature, it had tended for many years to fall increasingly into disuse. English supplanted Irish as the spoken and written language to such an extent that the proportion of people speaking Irish exclusively dropped to less than one-half of one per cent. The bilingual element of the population also decreased to slightly under 15 per cent, but in recent times this figure has increased considerably. The revival of the Irish language has been urged both as an expression of political national-

ism and as a step toward the rediscovery of Irish culture. The government of the Republic of Ireland (following a policy instituted under the Irish Free State) has restored the language to current use. The literature of the Irish is extensive, including legendry, history, poetry, and many works of value in theology and romance, some of the earlier dating from the 5th century. Many of the most eminent men classed with the English scholars and authors are Irish born. These writers include Jonathan Swift, Bishop Berkeley, Oliver Goldsmith, Edmund Burke, Richard Sheridan, Thomas Moore, Oscar Wilde, George B. Shaw, and James Joyce. Among the writers more distinctively associated with Ireland are such men as W.B. Yeats, George Russell (Æ), Sean O'Faolain, Sean O'Casey, John M. Synge, Liam O'Flaherty, Padriac Colum, and Douglas Hyde. The last named became the first president of Eire; all the above are treated under separate articles.

History. The early history of Ireland is wrapped in fable. It is thought that the Iberians, or a branch of the Mediterranean race, were the earliest inhabitants. Later the Celts settled in Ireland, coming there at different times, and still later came large numbers of Scots. The controlling influence seems to have been vested in various tribes until the Scoti, which were the most powerful, subdued the others. Subsequently they made incursions into Gaul and Britain, which was then a Roman colony. In the middle of the 5th century Christianity was introduced by Patrick, a Catholic bishop and missionary, probably a native of Southern England, who was taken as a slave to Ireland while still young. Later he escaped to Rome and returned to Ireland with the avowed intention of introducing Christianity. His work was successful and Ireland became a seat of learning, while its monasteries supplied many noted missionaries to continental Europe. This prosperity was more or less reversed, however, by the incursions of the Danes and other invaders from the north.

In 1167, while Henry II was King of England, the Norman invasion occurred. At that time the island was districted into counties, the lands were divided among Norman barons, and English courts were established at Dublin. Then likewise originated the feudal titles to lands, which continued to be a source of friction and hardship through all succeeding Irish history, and has neared solution only in this generation. A heroic defense was made against the invaders, and at the beginning of the 16th century the English were still unable to conquer the larger part of Ireland. An act of the Irish Parliament granted Henry VIII the title of King of Ireland, instead of lord, the title of Henry VII. This sovereign confiscated the lands of the church and attempted to force the people away from the Catholic religion, a measure bitterly opposed by the Irish. Elizabeth instituted a Protestant clergy, but the movement occasioned numerous uprisings under the Earl of Tyrone.

At the time of the Civil War in England, in the reign of Charles I, the Irish rose in rebellion and attempted to free themselves from the English dominion, but they were subdued by Cromwell in 1649. Many atrocities were perpetrated on both sides during this contest, and after the Irish and Loyalists were defeated they were generally banished to Connaught, while the English and Scottish settlers occupied the other portions. The struggle for independence continued during the reigns of Charles II and James II, but when the Irish preferred James to William III, the latter invaded Ireland in 1690, and in the Battle of the Boyne defeated the forces of James. In 1691 the Irish were defeated at Galway and Limerick, but a treaty was concluded by which the Catholic Irish were given religious liberty. This treaty was violated by Parliament granting about 1,000,000 acres of land to the Protestants, and severe penal laws were passed against the Catholics, by which it was aimed to exterminate that faith. The enactment of these laws excited bitter opposition.

When the war for American independence began, it gave the Irish an apparent opportunity to become free. Some of the penal laws were modified to appease the people, privileges to erect schools were extended, and some of the restrictions previously placed on the Catholics were withdrawn. However, a declaration of independence was made by the Irish Parliament in 1782 under the leadership of Grattan and Flood. The uprising was supported by both Protestants and Catholics in Ireland, who were alike anxious to secure more wholesome legislation for the common people, as well as to obtain complete liberty of conscience. When the French Revolution began, in 1789, the Society of United Irishmen was instrumental in making another desperate effort for independence, but the movement was crushed after much loss of life. The government at London now resolved to unite the Irish and English parliaments into one body. This was done by the Act of Union, which was adopted by the Irish Parliament in 1800. On Jan. 1, 1801, Ireland was united by proclamation with England in the same manner in which Scotland had been assimilated, except that it was not permitted to have as large a measure of local government, and the English Parliament became the supreme legislative authority. This measure was universally unpopular in Ireland from the beginning, causing several rebellions, and continued to be the source of much contention.

In 1829 the Catholic emancipation act went into effect, a measure making Catholics eligible

MONUMENT ON THE HILL OF TARA, COUNTY MEATH

From earliest times until 563 A.D., this was the site of the residence of the kings of Ireland. No trace remains today of the royal residence, but the Lia Fail—Stone of Destiny—upon which the kings were crowned has been preserved

to most public offices and to membership in Parliament. Since then many strenuous efforts have been made to secure the independence of Ireland. The Young Ireland rebellion of 1848 followed on the heels of one of the greatest national disasters in all history. A potato blight, which started somewhere in North America in 1844, reached Europe in the following year. While many countries were hit by the blight, the United Kingdom suffered the worst ravages. In a matter of days Ireland's potato crop lay rotting on the earth. In any country this destruction would have caused hardship; in Ireland, where virtually the entire nation lived on the potato crop, the result was catastrophic. In five years nearly 1,000,000 deaths resulted, directly or indirectly, from the famine. During the decade following 1847, over 1,500,000 persons emigrated. The over-all effect of the famine and its aftermath resulted in a decrease of the population by nearly 50 per cent.

Never absent from Irish political thought, the problem of landlordism was again brought to the fore by the potato famine. The system of absentee ownership which conferred no rights upon the tenants necessarily had a depressing effect on the country's dominantly agricultural economy. At the time of the famine, over 80 per cent of the rented farm units were smaller than 15 acres, and of these the large majority were less than three acres. Modern agricultural science has made possible the profitable operation of small farms, but this recourse was closed to the Irish farmer because of the conditions under which land was rented. The improvement of small holdings represents a large investment; under the Irish land system, such improvement usually resulted in eviction or higher rental. The manifest injustice of this procedure discouraged the employment of scientific agriculture and produced the "Three F" movement (Fair rent, Free sale, Fixity of tenure) which was organized in 1850. The demand for land reform grew, and, accompanied as it was by recurrent outbreaks of violence, led to the gradual rectification of the most flagrant disabilities.

Simultaneously with the land reform movement went the demand for Home Rule. The latter objective, encompassing many shades of political opinion, involved large numbers of Irish émigrés, especially in the U.S. In the latter country the Fenian Society was founded in 1863 by the most extreme advocates of violent separation. On several occasions Fenians were involved in terrorist and insurrectionist acts which may have contributed toward hastening reform legislation.

The official status granted to the Episcopal Church was a source of constant irritation to the predominantly Catholic population, and in 1869, after spasmodic outbreaks of violence that extended as far as Canada, the church was disestablished. The first important land legislation was the act of 1870 which gave the tenant a right to compensation for improvements if he was evicted for no fault of his own. A succession of poor harvests, however, soon made it apparent that this concession was not adequate to the need, and in 1881 the Land Act granted the "three F's."

Meanwhile Michael Davitt had organized the Land League in 1879. The leadership of the organization soon passed to Charles S. Parnell,

under whom the Land League grew to sizable proportions, making its influence felt throughout the country. One of Parnell's innovations in non-cooperation was the boycott (*q.v.*) which took its name from Capt. Boycott, an Irish land agent with whom Parnell's followers refused to have any dealings.

The growth of this movement produced harsh counter-measures on the part of the government, including summary arrest and imprisonment, but the grievances of the Irish farmers were too great to be ignored. In 1885 the land problem started on the road to solution with the passage of the first Land Purchase Act. Under this act, the state advanced to the tenant the full purchase price of his land. This loan was then repayable to the state over a 49-year period. Various amendments and additions to the Land Purchase Act had brought about transfer of most of the land prior to the establishment of the Irish Free State (*q.v.*), when purchase of the balance became compulsory.

Whatever its intention, land reform failed to silence the Home Rule movement. Parnell and other leaders continued to press for self government, and in 1886 British Prime Minister Gladstone (*q.v.*) attempted to compromise the issue by introducing a Home Rule Bill which provided for some degree of autonomy for Ireland. The bill roused furious opposition in England and Ulster (the northern province of Ireland which has remained loyal to England) and was defeated in the House of Commons. Despite its defeat, the bill had demonstrated that a section of British opinion recognized Ireland's plight.

Gladstone again introduced a Home Rule Bill in 1893, which this time passed the House of Commons but was defeated in the House of Lords. Other unsuccessful attempts at solving the question were made in 1907 and 1912 Under the Parliament Act of 1911, a bill passed by three successive sessions of Commons could become law without the assent of the House of Lords. The 1912 Home Rule Bill was, by this process, enacted in 1914, but did not go into operation because of the outbreak of World War I In the three years required to pass the bill, political sentiment in Ireland reached fever pitch. The bill did not distinguish between Ulster and the rest of Ireland; but the Protestant northern state feared that under a separate Irish government it would be subjected to the will of the Catholic majority. A large, armed group, known as the Ulster Volunteers, organized to oppose the enactment of the law or, if that proved unsuccessful, to set up a separate government at Belfast. The organization of the Ulster Volunteers aroused deep resentment in the south and led to the formation of an opposing army under the name of Irish Volunteers.

Out of the welter of conflicting forces rose the Sinn Fein movement which abandoned the demand for Home Rule and insisted upon complete independence. Planned and led by the most radical wing of Irish nationalists, a rebellion against British rule broke out on Easter Sunday in 1916. The battle was violent and costly, but the insurrection was soon suppressed and its leaders executed. The country, however, exclusive of portions of Ulster, was now solidly united in the demand for independence. At the general election of 1918, the Sinn Feiners won a majority and proceeded to constitute a national assembly which declared Ireland's independence. The declaration was ignored by Britain, and there came into being one of history's most remarkable undeclared wars. The technique of this war, on the Irish side, is credited to Daniel Breen, whose theory was that the abolition of English rule depended upon the destruction of the officers who enforced it. From early 1920 until 1922 terrorism and assassination were practiced by both sides, creating world sympathy for Ireland's attempt to break British rule. The first effect of this war was the passage (1920) of the Home Rule Act which divided Ireland into its present components. Instead of healing the breach, the act tended to aggravate the flaming differences. Inside Britain, public opinion turned against the government, and in July 1921, Prime Minister Lloyd George undertook to negotiate with the Irish national assembly. A treaty was concluded in the same year establishing the Irish Free State with dominion status (effective in 1922) comparable to that of Canada. By the terms of the treaty, six of the nine Ulster counties had the choice of allegiance and ultimately elected to retain their ties with Great Britain. For the later history of the remaining 26 counties, see *Irish Free State*.

Northern Ireland

Transportation. There are about 740 m. of railways in Northern Ireland Other available means of transportation are highways, navigable streams, and canals. Trade is chiefly with the rest of Great Britain and the Republic of Ireland.

Government. Northern Ireland has had its own government since 1920. The parliament of Northern Ireland consists of a Senate of 26 members and a House of Commons of 52 elected members. The executive power is in the hands of a governor representing the British Crown. Since 1928 women have had the right to vote on equal terms with men. The parliamentary counties included in Northern Ireland are Antrim, Armagh, Down, Fermanagh, Londonderry, and Tyrone; within the same jurisdiction are the county boroughs of Belfast and Londonderry. As part of the United Kingdom, Northern Ireland is represented in the British Parliament by 13 members.

Religion and Education. The prevailing re-

ligion is Roman Catholic although it is outnumbered by the combined Protestant sects. The Anglican (Episcopal) Church was the established church until 1869 and has 346,000 adherents. Presbyterian Church members number 391,000. Elementary education is free and compulsory. Secondary and technical education is supported by state grants. The principal college is Queens Univ. at Belfast.

History. The Government of Ireland Act (1920) established the parliamentary form of the Northern Irish government (see Government, above) and separated all its branches from the Irish Free State. The first parliament, summoned by the Lord Lieutenant of Ireland, met in Belfast on June 7, 1921. Its first problem was to overcome the disturbances that were the inevitable legacy of civil war. The nationalists in Ulster and Dublin continued to hope that all of Ireland might be united under the Free State, but the renewal of civil strife in the south in 1921-22 (see *Irish Free State*) strengthened the position of the Ulster Unionists (those in favor of continued union with Great Britain). In concert with Great Britain and the Irish Free State, Northern Ireland settled its boundary differences with the latter country by arbitration. By 1926 virtually all disputes of authority had been amicably resolved. In most respects, Northern Ireland has modeled its legislation upon that of England; internal affairs are directed by a local parliament; control over taxation, finance, and foreign relations has been retained by Great Britain. Among the first acts of the new government were the establishment of a comprehensive program of social insurance, old age and disability pensions, and a progressive educational system.

The development of Northern Ireland was somewhat retarded by the world depression into which the country was born. With heightening European tensions in the late 1930's came better relations with the Empire. King George VI visited Belfast in 1937; the following year a general election increased the strength of the governing party, and in 1939 the government declared its willingness to participate fully in England's preparations for war. With the actual outbreak of war, Northern Ireland undertook to meet its share of the cost, and stepped up production in all vital branches and a large number of new industries, catering for the needs of the home market, were established. For early history see History under *Ireland* above.

Republic of Ireland

Transportation. Railways are operated in all parts of Ireland, connecting the coast with the productive interior points. The total lines aggregate 2,481 m. Many of the streams are navigable in their lower courses for small boats, but the Shannon supplies the most important river transportation, and ocean steamers ascend it as far as Limerick. A number of the rivers have been canalized and connected by systems of canals. Navigable inland waterways total 650 m.

Government. Three of the four provinces or ancient kingdoms of Ireland and a part of the fourth are included in the Republic of Ireland. The country is divided into 27 counties and four county boroughs, each of which has a triennially elected council. The present constitution of Ireland, which dates from 1937, declares that Ireland is an independent, sovereign, democratic state. In respect to the government which it established, the new constitution closely resembles others in force in democratic countries. It provides that a president be elected for a term of seven years by direct vote of the people. Also elected is a House of Representatives or *Dáil Eireann*, consisting of 147 members. The Dáil nominates its own leader to the post of Prime Minister, or *Taoiseach*, which nomination must be confirmed by the president. A Senate (*Seanad Eireann*) of 60 members is indirectly elected on a vocational basis, and acts in an advisory capacity. The two houses constitute a Parliament, or *Oireachtas*.

Religion and Education. The prevailing religion is Roman Catholic, the clergy of which is supported by voluntary contributions. Among professed religions, the predominance of the Roman Catholic is overwhelming (93 per cent). The Anglican, or Episcopal Church, was the established church until 1869 and has 145,000 members, while Presbyterian Church membership numbers 28,000. Elementary education is free and compulsory. The school system has introduced the Irish language as part of the curriculum. Secondary and technical education is supported by state grants. Higher education is given principally at Trinity Coll., Dublin, and the National Univ. of Ireland which has colleges at Cork, Galway and Dublin.

History. For the earlier history of the Republic of Ireland, see History under *Ireland* above, and *Irish Free State*. The official name from 1937 until 1949 was Eire. The government and state of Eire declared its existence by virtue of a constitution approved by plebiscite July 1, 1937. In effect since Dec. 29 of the same year, the constitution proclaims Ireland a sovereign, independent, democratic state. The previously existing link with the British Commonwealth of Nations was not completely severed, however. The tenuous nature of that link was demonstrated by the fact that the nation was the only nation of the British Commonwealth that did not join the Empire in the prosecution of World War II. Although the authority of the nation is considered by the constitution to extend throughout all of

GLENGARRIFF, COUNTY CORK

Situated on the south Atlantic coast, this region is Ireland's Riviera

Ireland, Northern Ireland chose to remain a part of the United Kingdom.

Following the adoption of the 1937 constitution, the British government refused to recognize any fundamental change of status; also unchanged were the prohibitive tariff barriers which the two nations had erected against each other (see also *Irish Free State*). In 1938 discussions resulted in a series of agreements covering the principal points at issue. Great Britain agreed to turn over to the Irish military the coastal defenses at Berehaven, Cobh, and Lough Swilly, which it had been garrisoning; tariff walls were reduced, and the country undertook to repay £10,000,000 in final settlement of outstanding land annuities.

At the outbreak of war in September 1939, De Valera (*q.v.*) of the Fianna Fáil (Soldiers of Destiny) party hastened to proclaim the neutrality of the nation. The government was given emergency powers, however, and extensive news censorship was put into effect. Supply difficulties and interruption of trade soon resulted in strict rationing, and the railroads and industries operated under great difficulties. De Valera twice blocked British conscription in Northern Ireland, but many Irish volunteers joined British forces. Throughout the war the government continued this opposition, protesting also against the stationing of U.S. troops in that section. The nation was bombed by the Germans on a few occasions, but some of the country's damage claims were recognized, and neutrality was maintained.

Eamon de Valera, the last president of the Irish Free State, served as prime minister during the term of the country's first president, Dr. Douglas Hyde (1938-45). He retained this post when Sean T. O'Kelly became president (June 18, 1945). Beginning with the general elections of 1948, the government has alternated between De Valera and John A. Costello of the Fine Gael (United Ireland) party. The Republic of Ireland Act (1948) changed the country's name, from Eire to Republic of Ireland, effective in 1949. Its membership in the British Commonwealth of Nations was also ended at that time. In 1948 Ireland participated in the European Recovery Program (*q.v.*) and was admitted to the U.N. in 1955. Economically, the nation has been plagued by an excess of imports over exports; and emigration reduced the population by more than 65,000 between 1950 and 1955. Although raids on Northern Ireland were continued by irregular bands, the government stated (1956) it would ask the U.N. to discuss Ireland's claim to Northern Ireland "if a favorable opportunity presents itself."

Ireland, JOHN, Catholic prelate, born in Kilkenny, Ireland, Sept. 11, 1838; died Sept. 25, 1918. His parents settled at St. Paul, Minn. He was ordained a priest at St. Paul in 1861, became a chaplain in the army, and after the war was rector of the cathedral at St. Paul. In 1875 he was ordained bishop, and in 1888 became archbishop of St. Paul For some time he was a director in the National Colonization Association and aided

in establishing the Catholic Univ. at Washington, D.C. He published a number of works, including "The Church and Modern Society."

Irenaeus (*ī-rē-nē'ŭs*), SAINT, a Christian writer of the latter part of the 2d century. It is thought that he was born in Asia Minor about 125 A.D. He was a disciple of Polycarp, the Bishop of Smyrna, and became a priest at Lyons, in Gaul. Later he was made a bishop as successor of Photinus, who suffered martyrdom in 177, and in that position was an active opponent of the Gnostics. He led in the discussion concerning the day that should be observed as Easter. It is thought that he suffered martyrdom in the persecution under Septimius Severus in 203.

Irene (*ī-rē'nē*), Empress of Byzantium, born in Athens, Greece, *ca.* 752; died on the isle of Lesbos in 803. By her beauty and talent she attracted the attention of Leo, afterward Emperor Leo IV, whom she married in 769. After his death in 780, she became regent for their young son, Constantine VI. During her regency Byzantium suffered from many internal disturbances and political conflicts. A strong advocator of icon worship, which had been suppressed by Leo IV, she was constantly involved in controversies with the iconoclasts (see *Iconoclast*). Her son in 797 led a conspiracy against her, but was defeated and blinded. However, revolts against Irene continued and in 802 she was banished to the isle of Lesbos, where she died. For her devotion to the Greek Church and support of icon worship she was made a saint of this church.

Ireton (*ĭr'tŭn*), HENRY, soldier, born at Attenborough, England, in 1611; died Nov. 26, 1651. He studied at Trinity Coll., Oxford, and soon after joined the Parliamentary army against Charles I. At the Battle of Naseby he was taken prisoner by Prince Rupert, but escaped the following day. He signed the death warrant of Charles I, having served as a member of the court. In 1649 he accompanied Cromwell to Ireland, who appointed him lord deputy and left him there to conquer the island. His death occurred just after the capture of Limerick. He was buried in Westminster Abbey, but after the Restoration his remains were exhumed and burned.

Iridium (*ĭ-rĭd'ĭ-ŭm*), element No. 77, a rare metal of the platinum group, so named from its iridescent compounds. It resembles platinum in its white, lustrous color, but is harder and more brittle. It is one of the heaviest elements, with a specific gravity of 22.42. Its melting point is 1,950° C. It is insoluble in any single acid, and is attacked with *aqua regia* only under special conditions. Iridium was discovered in 1804 by Charles Tennant, a Scottish chemist. Iridium is used as an alloy to harden platinum for jewelry, a favorite alloy being 10 per cent iridium with 90 per cent of platinum. Its value is comparable to that of platinum and iridio-platinum alloys are frequently called "platinum." Iridium is alloyed with osmium for use in pen points and compass bearings. Iridium is also used to coat hydrogen electrodes, in resistance wires, and in other electrical contacts; in chemistry it is used as a catalyst. Iridium occurs with platinum, or in alloys with osmium, in areas in Russia, Colombia, South Africa, Canada, and Alaska.

Iris (*ī'rĭs*), in Greek mythology, the daughter of Thaumas and Electra; she personified the rainbow and was the messenger of the gods, especially of Hera, as described in Homer's "Iliad." She became the wife of Zephyrus and the mother of Eros. Her mission was to communicate between gods and men, a task she executed with tact, intelligence, and swiftness. She is represented with the staff of a herald in her left hand and with golden wings attached to her shoulders.

Iris, a genus of plants also known as *flag* and *fleur-de-lis,* in the Iris family. From a perennial stem, long narrow leaves come up every year, and stiff upright stalks with from one to 12 showy flowers, white to purple, yellow, or brown, with complicated markings. Some of the best-known varieties are in the *tall bearded* group, native to temperate regions of the Old World. The *beardless* group, growing in wet places, includes the Japanese and Siberian irises, and the native American kinds, the best-known of which is the large blue flag (*Iris versicolor*), whose horizontal stem was formerly dried and used in medicine as a cathartic, diuretic, and emetic. Orris (*i.e.,* iris) root, the dried horizontal stem (powdered) of any of three Mediterranean species (*Iris florentina, germanica,* and *pallida*) is used for sachets, for flavoring tooth powder, and as a principal ingredient of dry shampoo powders.

Iris, the colored portion of the eye that surrounds the black central pupil, which is an aperture in the iris. It consists of a muscular curtain of three layers, the anterior, posterior, and middle fibrous. The surface is variously pigmented, giving the eye its color. *Iritis* is an inflammation of the iris, due to a prolonged use of the eye, to injury or accident, or to rheumatism or some other constitutional disease.

Irish Free State (*ī'rish*), the name of the former dominion of the British Commonwealth comprising all of Ireland with the exception of six northeastern counties. The Free State was divided into 26 counties and four county boroughs. The dominion assumed the name of Irish Free State on Jan. 15, 1922, as a result of a treaty previously concluded with Great Britain; the name ceased to have official standing as of Dec. 29, 1937, on which date a new constitution came into operation, designating the territory as a sovereign, independent, democratic state with the

name of Eire. For descriptive treatment of the country and history before the establishment of the Irish Free State, see *Ireland*.

The conferences between the British government and the unrecognized government of Ireland, called to put an end to the violence that was ravaging the country, resulted in the publication of a treaty, in 1921. In the course of the preceding war of independence, a *de facto* republican government had been established, and many of its influential members now refused to accept the dominion status offered by the treaty. The more moderate element set up a provisional regime with which, however, the republican leaders refused to co-operate. Leader of the republican wing was Eamon de Valera, who had been president of the revolutionary National Assembly; opposing him was the rightist group led by Michael Collins. The conflicting forces carried into the new regime the methods of warfare that had marked the revolutionary struggle just completed, and the country continued to be torn by active civil fighting. A general election held in June 1922 showed a majority in favor of accepting the treaty, but instead of deciding the issue, this served only to precipitate a renewal of violence. Fighting broke out in Dublin at the end of June and, although the bloodiest phase was over in about a week, guerilla action continued for more than a year. On Aug. 22, Collins was assassinated, increasing the difficulties of the Free Staters, who were now faced with an urgent need to complete an acceptable constitution. The Dáil or national assembly, meeting for this purpose, elected William Cosgrave president and set about the difficult task of restoring order and re-establishing the prestige and authority of the state.

The problems confronting the new government were legion, and the formal ratification of the constitution on Dec. 6, 1922, was but a small step toward its goal.

The widespread material damages and the greatly disturbed conditions had put a tremendous drain upon the national resources; an additional difficulty was the suspicious attitude of the people toward the forces of law and order which had for so long been an instrument of alien rule. Moreover, the general postwar depression weighed heavily upon the Irish Free State. Taxes had to be maintained at old levels or increased; arrears of land annuities and other payments, withheld during the war years, were now required to be paid. Employing its new authority, the government levied experimental import duties, with the object of fostering domestic industry, but with the incidental result of raising the prices of some vital commodities.

Added to these handicaps were the political resentments aroused by the civil war and its aftermath. More than 10,000 republican prisoners were held in jail, and execution of republicans continued. But now, for the first time in 700 years, a native Irish government had the opportunity of reorganizing the national economy, and it quickly set about its task. Completion of land purchases, begun in 1885 (see *Ireland*), was made compulsory; in the same year (1923) the Irish Free State joined the League of Nations; a crisis that arose over a boundary dispute with Northern Ireland was settled by compromise; a financial agreement, especially with reference to unpaid land annuities, was reached with England. Within five years the new state found itself economically and politically solvent.

Although opposition to the regime had largely subsided into constitutional channels, it had by no means disappeared. De Valera's republican party, or *Fianna Fail*, increased in popularity at the expense of Cosgrave's *Fine Gael* (see also *Sinn Fein*). Although the republicans had been consistently in control of many seats in Parliament, they had refused to assume these seats or to take the necessary oath of allegiance to the king. Following the election of 1927 which had improved De Valera's position, Kevin O'Higgins, vice president of the Executive Council, was assassinated on July 10. Although the republicans were never implicated in the murder, President Cosgrave, by means of drastic public safety legislation, ended the parliamentary separation by requiring republican deputies to take their seats in the Dáil and imposing on all future candidates an oath of loyalty to the constitution. Announcing that they did not consider the oath binding, the republicans acceded to the ruling, entered the Dáil, and thenceforth continued in opposition within the parliamentary framework. De Valera's electoral strength continued to increase until, in 1932, he became president. Immediately upon assuming control of the Dáil, De Valera introduced legislation to weaken further the constitutional link between Ireland and England. Most important of these acts was the stoppages of annuity payments. Since the creation of the Irish Free State, the new government had continued to repay the land-purchase annuities advanced by the United Kingdom government during its period of control. De Valera's government now disputed the legality of the British claim to these payments in view of the terms of the treaty creating the Irish Free State and proceeded to withhold the 1932 installment amounting to £1,500,000. In reprisal, the British government imposed a prohibitive import duty on Irish products; this was countered by similar action on the part of the Irish. The tariff war created greater hardship in the Free State than in industrially independent England, but while it aroused many protests against De Valera's course, his government was returned to power at the general election held after the

commencement of the economic war. Instead of weakening, De Valera deepened the rift between the two countries in still other ways. In 1937 a new constitution (approved by popular plebiscite in July, to take effect Dec. 29) proclaimed Ireland a sovereign independent democratic state loosely associated with the British Commonwealth of Nations and adopted the Gaelic name of *Eire*. The new state of affairs was accepted by Great Britain, and in the following year an agreement was concluded between the two governments for the evacuation of British troops from the coastal defense stations at Bere Haven, Cobh, and Lough Swilly and settling outstanding monetary claims for land annuities and damages to British property. For later history and government, see *Eire*.

Irish Language. See *Ireland*.

Irish Moss or CARRAGEEN, the name of several species of seaweed common to the coast of Ireland and other countries of Europe. They are not mosses, but are algae, and thrive on rocky and stony coasts. The common *carrageen* yields the greater part of the Irish moss of commerce. It is used as medicine and as an article of food. The plant is branched, grows to a length of from 2 to 12 in., and is reddish brown in color. It is prepared in the form of jelly and blancmange by boiling in water or milk, then adding some sugar and spices. Iceland moss, although used in a similar way, is a different plant, being a lichen.

Irish Sea, a body of water located between Ireland and Great Britain, connected with the Atlantic Ocean on the north by North Channel and on the south by St. George's Channel. Its length is about 135 m., and the width varies from 60 to 120 m. Several islands are located within it, including Anglesey and the Isle of Man.

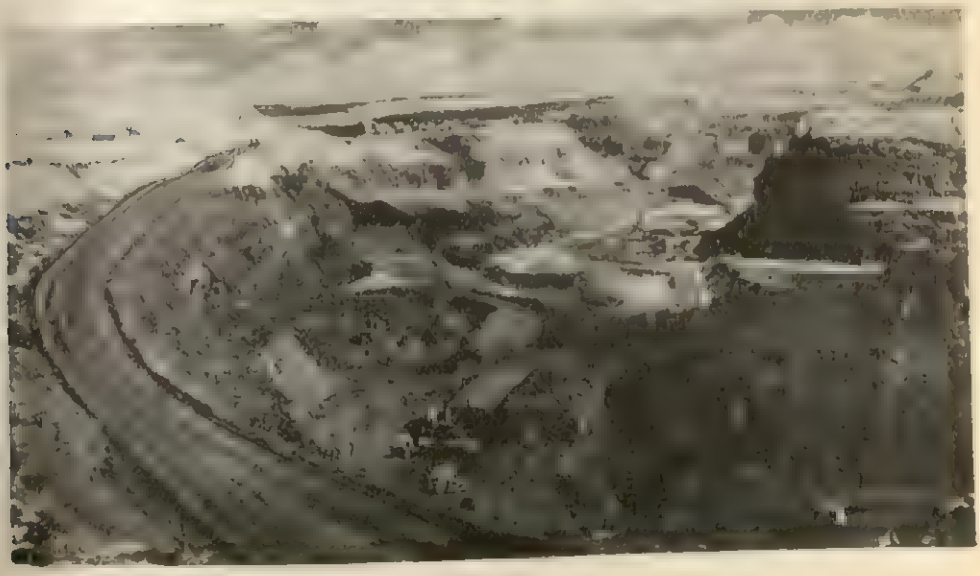
Iritis (*ī-rī'tĭs*). See *Iris* (eye).

Irkutsk (*ĭr-kōōtsk'*), a city in the U.S.S.R., capital of the Irkutsk Region of the R.S.F.S.R. It is located on the Angara River, 40 m. N. of Lake Baikal. The commercial center of Siberia, it is an important station on the Trans-Siberian R.R. It has a number of fine hospitals, churches, and seminaries. The manufactures include linen goods, leather, machinery, furniture, and woolens. The trade in tea, furs, and cereals is extensive. Irkutsk was founded in 1652, but its prosperity dates from the growth of Russian influence on the Chinese boundary areas. In 1918 it was held by Czech detachments who opposed the Bolsheviks. Population, *ca.* 250,000.

Iron (*ī'ûrn*), an element and an important metal (atomic number, 26; symbol Fe; and atomic weight, 55.85). It is found in nearly all forms of clay, earth, and rock, though rarely in a pure state. When pure, it is silvery-white, very tenacious, malleable, and ductile. The commercial product is derived from ores which are abundant and widely distributed; they are known as magnetite, hematite, siderite, and limonite. Ores classed as *magnetite*, when pure, contain 72 per cent of iron and are so named because the iron in them occurs as magnetic oxide. *Hematite* may be red, blue, or specular. *Limonite* consists of hydrated oxides and includes the bog and other ores. *Siderite* contains carbon dioxide. Iron is found in varying propor-

AN OPEN PIT IRON MINE NEAR VIRGINIA, MINN.

Courtesy American Iron and Steel Inst.



Courtesy American Iron and Steel Inst

PIG IRON PRODUCTION—BLAST FURNACE DOUBLE-STRAND PIG-CASTING MACHINE

tions in both sea water and mineral water and forms an essential constituent of plants and animals. The sun and stars contain iron, and it constitutes a large portion of meteorites that fall from space to the earth.

Absolutely pure iron is seldom seen, except in laboratories, where it is used for experimental purposes. *Pig iron,* a commercial iron produced in a blast furnace, contains a large proportion of carbon. Neither ductile nor malleable, it can be remelted and cast in molds, thus producing the desired objects of *cast iron. Wrought iron* is usually fibrous, ductile, and malleable, and contains very little carbon or other impurities. Formerly produced in a puddling furnace or a forge, it is now produced mainly by a special process known as the Aston process. *Steel* (*q.v.*) is an alloy of iron and other elements. Salts of iron are used in medicine as tonics.

The iron deposits of North America are extensive. In the production of pig iron, the U.S. exceeds every other country in the world. Nearly all states of the Union and most of the provinces of Canada have iron deposits, though there are some districts in which they are especially abundant. The most productive iron fields operated at present are those of the Lake Superior region, from which about two-thirds of the iron ore is obtained. Other vast deposits are in Pennsylvania, Ohio, Alabama, Tennessee, Virginia, Minnesota, and Missouri. Pennsylvania leads in the manufacture of iron products. In 1720 the first blast furnace in Pennsylvania was built 8 m. N. of Pottstown, and the first rolling mill in Pittsburgh was built in 1811. The iron industry of the Southern states is making rapid progress, owing to the vast iron ore and coal deposits in that region, and the industry has also been developed in the states of the West, especially in Colorado, Utah, and California.

In 1956 the estimated world production of pig iron and ferroalloys totaled 220,000,000 net tons, and that of the first five countries was, in millions of net tons: U.S., 78; Russia, 40; Western Germany, 20; Great Britain, 15; and France, 13. Other pig-iron producing countries include Australia, Austria, Belgium, Brazil, Canada, Czechoslovakia, Chile, China, Eastern Germany, Finland, France, Hungary, India, Japan, Luxemburg, Mexico, The Netherlands, Norway, Poland, Spain, Sweden, Turkey, the Union of South Africa, and Yugoslavia. The manufacture of all forms of machinery and utensils and the construction of large buildings have increased remarkably the demand for iron and steel. There are few machines now produced that do not consist largely of these metals.

History: Iron is one of the metals earliest known in history, being mentioned in the Bible as early as Genesis 4:22, where Tubal-Cain is spoken of as "instructor of every artificer of brass and iron." Egyptian sepulchers represent butchers sharpening their knives on a round bar of metal. The vast deposits of iron ore in India were known from remote times, and the Romans utilized products of iron at an early period. Iron mines were operated in Britain as early as 54 B.C. and much earlier in continental Europe, especially in Germany, Spain, and Italy. When the Egyptian obelisk was removed from Alexandria to New

York, in 1880, a piece of iron was discovered under its base, which was estimated to have been there for over 1,900 years. Tools made of iron and steel more than 3,000 years ago are preserved in museums at Rome, Berlin, London, Paris, and other cities of Europe.

After the decline of Rome, Spain became noted for the production of iron and steel. During the Moorish occupation of Spain, the famous Catalan forge arose in Catalonia about A.D. 1300. Hot spongy iron was produced in that forge from iron ore, charcoal, and a blast of air; the hot iron was removed from the furnace and hammered into a form of wrought iron. Efforts in Germany, during the 14th century, to increase the capacity of that type of furnace led to the development of the "Hochofen" or high furnace, in which molten pig iron was produced. That furnace was the forerunner of the modern blast furnace. Coal was first used in the blast furnace in 1619 in England, and coke was introduced a century later.

The imperfectly worked iron ore left in Britain by the Romans supplied materials for some of the high-grade furnaces for nearly 300 years, once the increased heat of coal and coke became available. In 1585 iron deposits were discovered in North Carolina by an expedition sailing under Sir Walter Raleigh. The iron first used in America was smelted in Europe. The first successful American blast furnace was built at Saugus in Massachusetts during 1646-47.

Among the valuable improvements in the manufacture of iron may be mentioned those of Cort, who, in 1783, secured a patent on machinery used in rolling and the next year was granted a patent on devices employed in puddling. Dalton discovered the hot blast in 1827. During the period 1847-57, William Kelly, in the U.S., invented the "pneumatic" process of converting molten pig iron into steel. A similar process was invented independently by Henry Bessemer in England during 1854. The process was performed in a furnace later called the "Bessemer converter." Steelmakers in the U.S. developed (1948) a method for casting semifinished steel in one continuous casting process. See *Blast Furnace; Rolling Mill; Steel.*

Iron Age (*ī'ŭrn āj*), the third of the three Metal Ages, the first two being the Age of Copper and the Age of Bronze. The Iron Age probably had its beginnings in the Near East and Egypt, about 1300 B.C., and reached Europe about 1000 B.C. From the Iron Age as such (lasting to about the year A.D. 1), a gradual transition ensued to the more complicated technologies of modern times.

In general, this age is marked by the expert use of bronze; the knowledge of the extraction of iron from ore, and the working of the new metal into both wrought and cast forms—swords, axes, safety pins, locks and keys, scissors, etc.; the discovery of animal domestication; and the development of great skill in pottery-making, including the introduction of the potter's wheel.

Commerce reached a high level of development, with forms of currency varying from blunt iron bars to wheels, rings, and coins. Agricultural implements of iron included the plow, scythe, and sickle; the handmill with circular rotating millstone first came into use.

Numerous cemeteries of this time located in Central Europe testify to a relatively dense population, some containing from a hundred to a thousand burials. See also *Pre-History.*

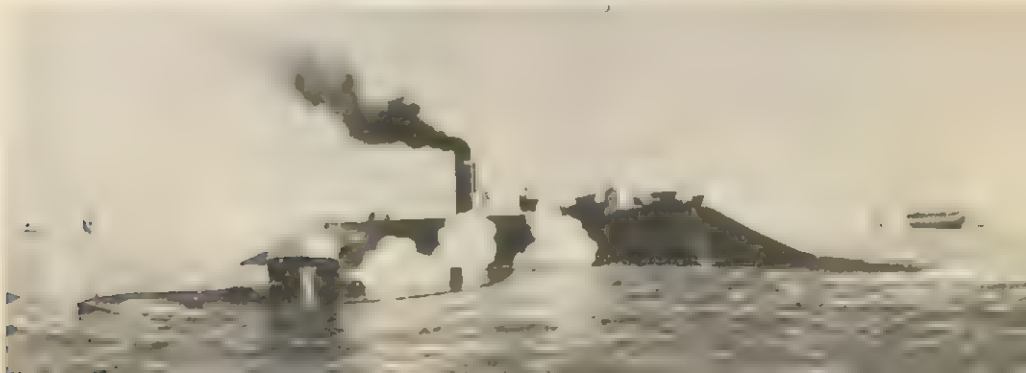
Ironclad Vessels (*ī'ŭrn-klăd vĕs'lz*), naval vessels that are protected by iron or steel plates from the fire of heavy guns. The first ironclad vessels were constructed of wood with iron elements attached to the outside surfaces; modern warships, however, are built almost entirely of steel.

The British used ironclad vessels in 1860, and they were introduced in America in the Civil War. Since the Russo-Japanese War, the very basis of naval strength has been the heavily armored ship which is capable of inflicting damage and at the same time of surviving damage. See *Merrimac; Monitor; Warship.*

Iron Cross (*ī'ŭrn krôs*), a German military decoration given for distinguished service. It was

FIRST IRONCLAD VESSELS TO ENGAGE IN COMBAT

The *Merrimac* and the *Monitor*



first awarded by Frederick William III of Prussia (1770-1840) in recognition of distinguished services in war. It was revived during the war with France and in the two World Wars. The order comprises several classes.

Iron Crown (*ī'ŭrn ḳroun*), a crown used at the coronation of the kings of Lombardy and afterward by the German emperors, when the latter were sovereigns of that country. It was made of six pieces and is adorned with jewels, enamels, and golden roses. The crown was so named from an iron circle, which, according to tradition, was forged from a nail used in the crucifixion of Christ. Charlemagne, when he united Italy with Germany to form the Holy Roman Empire, wore this crown.

Iron Curtain (*ī'ŭrn ḳûr't'n*), a political term used to describe the almost inpenetrable barrier created by the U.S.S.R. between the Eastern European countries in her sphere of influence and control and the nations of the rest of the world. The coinage of the phrase is attributed to Count Schwerin von Krosigk, a German statesman, and its popularization to Winston Churchill, who used it in a speech in Fulton, Mo., in 1946. The term was particularly accurate during the postwar Stalinist period.

Iron Gate (*ī'ŭrn gāt*), a narrow gorge in the Danube River, between Orsova and Turnu-Severin, Rumania, on the Yugoslavia boundary. The series of rapids once constituted a serious obstruction to navigation until the Hungarian government constructed (1895-99) canals in the river bed, which allowed passage of barges weighing up to 700 tons.

Iron Law of Wages (*ī'ŭrn lô of wā'ĕz*), in economics, an axiom developed by Ricardo, Malthus, and Lassalle (*qq.v.*), by which the level of wages is made dependent on the available supply of labor and the demand for goods. Higher wages will lead to an increase in the number of laborers, which will, in turn, lead to a surplus of labor; this will again lower wages, and so on *ad infinitum*. This theory was considered by the economists above mentioned as the basic fault of the capitalistic system. Malthus suggested birth control as a remedy for the situation.

Iron Mask (*ī'ŭrn màsḳ*), THE MAN WITH THE, a name describing a mysterious personage of France, who was kept in various prisons for many years. Some assert that he was a relative of Louis XIV, and that he once became angry and boxed the ears of the grand dauphin, an act for which he was imprisoned for life. He is spoken of by Voltaire as a prince of noble appearance, and it is related that an iron mask concealed his face when he was transferred from one prison cell to another although the mask is believed to have been actually of black velvet. In the later years of his life he was confined in the Bastille. Considered by some the half-brother of the grand dauphin, son of Louis XIV; others believe that he was Count Mattioli, an agent of Italy.

Iron Mountain (*ī'ŭrn moun'tĭn*), a city, the county seat of Dickinson County, Mich., near the Menominee River, 50 m. w. of Escanaba. It is on the Chicago & North Western and the Chicago, Milwaukee, St. Paul & Pacific R.R.'s. It is noted for its winter sports, and as a summer resort. The industries include machine shops, a foundry, woodworking plants, a clothing factory, an automobile plant, and iron mining. The city was settled in 1873 and incorporated in 1888. Population, 1940, 11,080; in 1950, 9,679.

Iron Mountain OR IRON MOUNT, a hill in St. Francois County, Mo., 81 m. s. of St. Louis. It has an area of 500 acres and rises to an altitude of 200 ft. above the surrounding country. The deposits consist of specular or hematite iron ore and appear to be inexhaustible, constituting one of the richest and purest iron ores in the U.S. Near it is Iron Mountain, a village with a population of about 350, which was formerly a prosperous mining community.

Ironton (*ī'ŭrn-tŭn*), a city, the county seat of Lawrence County, Ohio, on the Ohio River, about 30 m. above Portsmouth. It is on the Norfolk & Western, the Chesapeake & Ohio, and the Detroit, Toledo & Ironton R.R.'s. On the opposite side of the river is Russell, Ky.; here the river is crossed by a passenger bridge. Manufactures include cement, bricks, machinery, motor bodies, chemicals, leather goods, and clay, iron, and steel products. The surrounding country has deposits of bituminous coal, salt brine, iron ore, and brick, tile, and fire clays. Ironton was settled in 1832 and incorporated in 1849. Population, 1950, 16,333.

Ironwood (*ī'ŭrn-wŏŏd*), the name of several species of hornbeam, a tree native to North America. This tree is rather small, rarely exceeding 6 in. in diameter, and the wood is hard and tough. A similar forest tree is native to South America. The ironwood of commerce is obtained from a myrtle of the eastern part of Asia. This wood is extremely hard, dark colored, and so heavy and dense that it sinks in water. The Chinese and the East Indians use it for anchors. Because of its hardness and density, ebony is sometimes called ironwood.

Ironwood, a city in Gogebic County, Mich., on the Montreal River, 150 m. w. of Marquette. It is on the Soo Line, the Duluth South Shore, and the Chicago & North Western R.R.'s. Formerly a mining community, it now has diversified industries manufacturing gloves, woodenware, cement blocks, food, lumber, and other products. The surrounding country is included in the rich Gogebic iron range of Michigan and Wisconsin. The place was settled in 1884 and

incorporated in 1887. Population, 1950, 11,466.

Iroquoian Indians (*ĭr-ō-kwoi'ăn ĭn'dĭ-ănz*), a large group of American Indians, comprising one of the most important North American linguistic stocks. Originally the northern division of these tribes occupied the area lying between the Gulf of St. Lawrence and the eastern shore of Lake Huron. This group includes the Iroquois proper, the Erie, the Huron, the Conestoga, and several others. Jacques Cartier (*q.v.*) first came into contact with them at Gaspé Basin in 1534, when they were well established in the region now included in Quebec, Ontario, New York, and Pennsylvania. The northern Iroquoian tribes are closely related in language to the Cherokee of the Carolinas and Alabama and to the Tuscarora of western Virginia and North Carolina, although the two major groups appear to have separated from one another at an early date. See *Iroquois*.

Iroquois (*ĭr-ō-kwoi'*) or SIX NATIONS, a confederation of North American Indian tribes. They were first known as the Five Nations, which included the Mohawk, Onondaga, Seneca, Oneida, and Cayuga tribes, and numbered about 15,000 persons. In 1722 the Iroquois were joined by their southern kinsmen, the Tuscarora, and the union became known as the Six Nations. Probably no other Indian nation has so seriously affected the course of American history. Close contact with white people did not begin until 1615, when the Dutch opened a trading post at Albany. Armed with the firearms that they obtained in exchange for furs, the Iroquois rapidly subjugated the surrounding tribes. Throughout the 17th century they carried on extensive hostilities against the French, an important factor in protecting the New England colonies against French aggression. Subsequently they became firm allies of the Dutch, and later of the English, the majority of the tribes taking the British side in the American Revolution. In 1784 the Iroquois concluded a peace treaty with the U.S., and the greater portion moved across the lakes into Ontario. In the War of 1812 the American and Canadian branches were pitted against each other, but at the close of that war a lasting peace was concluded. At present the Iroquois number about 12,000, many of whom have embraced Christianity and Western European culture. The larger part of those in the U.S. are in New York, Wisconsin, and Oklahoma. Their most distinguished men include Joseph Brant, Cornplanter, and Red Jacket (*qq.v.*).

Irradiation (*ĭ-rā-dĭ-ā'shŭn*), the process of subjecting matter to such agencies as gamma rays, X-rays, alpha rays, ultraviolet light, visible light, or infrared light. Numerous complex chemical and biological effects result from irradiation, but all of them may be traced to ionization produced by energy abstracted from the radiation. An important example of photochemical reaction is the formation of vitamin D by the irradiation of ergosterol (*q.v.*) with ultraviolet light. See also *Actinism; Dairying*.

Irrawaddy (*ĭr-ă-wŏd'ĭ*) or IRAWADI, a river of southern Asia, rising in the Himalaya Mts. It has an almost southerly course of 1,350 m., and flows into the Bay of Bengal. It has an extensive delta, and the river valley is exceedingly fertile. As a highway of commerce it is more important than either the Indus or the Ganges. During the Burmese wars it furnished the chief means for British advancement, and now carries the bulk of the trade through central Burma. Levees are maintained for a distance of 100 m. from the sea to protect the lowlands from overflows. Among the tributaries are the Chindwin, the Shweli, and the Myitnge. The cities on its banks include Mandalay, Rangoon, Ava, and Prome.

Irredentists (*ĭr-ĕ-dĕn'tĭsts*), originally members of an Italian patriotic movement which, after the unification of Italy, agitated for the emancipation of those regions still under Austrian, Swiss, or French rule. The movement was based on the principle that national and political frontiers should coincide. The term has come to designate any group aiming at political union with the motherland of regions still under foreign rule.

Irrigation (*ĭr-ĭ-gā'shŭn*), a system by which the fertility of soils is produced or increased by supplying an adequate amount of water for the production of crops. The term is likewise applied to a system of periodical inundation, whereby the fertility is increased, or by which the tillage of rice is made possible. Irrigation is necessary in

CONCRETE IRRIGATION DITCHES

FIELD IRRIGATION

most instances where the rainfall is less than 20 in. per year, but this depends somewhat upon the character of the soil, the kinds of crops grown, the amount of evaporation, and whether the precipitation is chiefly in the growing season. The value of irrigated land ranges from $10 to $1,000 per acre, depending upon the locality of the classes of plants that are cultivated.

The cultivation of lands under a method of irrigation is one of the oldest of industries and was utilized extensively in prehistoric ages. It was practiced extensively in the Nile River Valley in Egypt more than 2,000 years before the Christian era, when great artificial lakes and canals were built for the purpose of conducting the water across the barren and otherwise unproductive surface to the tracts containing elements of fertility. The same system was in common use among the peoples of Persia, India, China, Mesopotamia, and other eastern countries which have an arid climate. In New Mexico and Arizona, as well as other portions of the U.S., are traces of systems of irrigation that were built by prehistoric peoples. However, in many localities the physical conditions have changed materially. In some instances the supply of water has become exhausted and the rivers have dried up entirely, or have become lowered in their channels to such an extent that the irrigated regions are left far above and remote from the former source of water. In the Salt River Valley of Wyoming are remains of former irrigation systems that have been followed more or less by modern canals, and the leveling performed centuries ago by forgotten races is still a source of utility. Forerunner of recent irrigation in the U.S. was the system introduced in Utah in the mid-19th century by the Mormons, who were successful in redeeming dry land for food production. Old as the system is, there have been few basic changes from the methods employed in remote times.

In the western portion of North America, both in Canada and the U.S., are large tracts of land where rainfall is not sufficient for the production of crops, and formerly served only for pasture lands. Many localities of this region have been improved by irrigation. In many portions of Arizona, Idaho, Colorado, California, Oregon, Utah, Washington, Montana, New Mexico, Nevada, Wyoming, and Alberta much value has been added to lands by irrigation. In some regions the water supply is drawn from rivers, while in others vast reservoirs are maintained to catch the water coming from melting snows, and this is distributed by means of canals at the proper season. Most irrigation consists of flooding the land by ditches or furrows between ridges of cultivated land; in a few instances sprinkling systems to supplement rainfall are used. In portions of South Carolina, Georgia, Texas, Louisiana, and other states irrigation takes on the form of inundation, which is an essential in the cultivation of rice.

The U.S. has reclaimed by irrigation over 20,500,000 acres of land, principally in the Western states, but also in Arkansas and Louisiana. California reports the largest area of reclaimed land, about 5,000,000 acres, while Colorado has over 3,000,000, Idaho, Montana, each about 2,000,000 acres, and Utah, Wyoming, Texas, and Oregon each have well over 1,000,000 acres irrigated. The largest irrigated area of the world is in India, where over 55,000,000 acres have been reclaimed. Egypt has several millions of acres of

reclaimed land, greatly increased by the Assuan and the Gebel Aulia reservoirs. All other countries, too, make more or less extensive use of irrigation.

Congress passed the Reclamation Act on June 17, 1902, which is greatly facilitating progress in reclaiming arid regions. Under this law 50,000 acres of land in Nevada were supplied with water in 1905 by the great Truckee-Carson system. It is so named from the Truckee and Carson Rivers, which rise on the eastern slopes of the forest-clad Sierra Nevada Mts. in California, and flow in a general northeasterly direction into Nevada. The drainage basin of the former contains a number of beautiful lakes, including Lake Tahoe, all of which are to be utilized for flood storage. In Nevada these rivers flow for some distance parallel to each other, and at one point not more than 20 m. apart. The Truckee River then flows northward from Wadsworth, passing into Pyramid and Winnemucca Lakes, and the Carson River, dividing into three channels, ultimately disappears in Carson Sink.

Similar projects have been carried out under the Appropriation Act of 1930 in Oregon, Idaho and other states, a notable example being Grand Coulee Dam.

The U.S. Bureau of Reclamation (established 1902) has built more than 50 operating projects to supply approximately 4,000,000 acres with needed water. The remainder of irrigated land referred to in the above paragraph is served by privately owned works. The Bureau, working through the Department of the Interior, supervises reclamation projects which today also involve, in addition to irrigation, ample flood control, improvement of navigation, etc. The generation of hydroelectric power in connection with the dams built by the Bureau is also an important feature. See *Dams*.

Irtish (*ĭr'tĭsh*), or IRTYSH, a river of Asia, the most important tributary of the Obi. It rises in the Altai Mts., in China, and after a northwesterly course of 1,625 m. joins the Obi near Samarova. The valleys of the upper Irtish and its tributaries are among the best cultivated and well populated districts of Siberia, and through the region passes to the Trans-Siberian R.R. Tara, Omsk, and Tobolsk are among the ports on the Irtish.

Irving (*ĕr'vĭng*), SIR HENRY, formerly John Henry Brodribb, celebrated actor, born in Keinton, England, Feb. 6, 1838; died Oct. 13, 1905. He studied in London, became a clerk, and in 1856 made his first appearance on the stage at the Sutherland Theater, London. Subsequently he played three years at Edinburgh, then returned to London, and later remained for five years at Manchester. His reputation was made in 1870, when he took the part of *Mathias* in "The Bells." Irving became distinguished for his excellent voice and gesture, and because he elevated the drama by presenting artistic performances. In 1874 he produced "Hamlet" for 200 nights consecutively, and about 1885 added "Macbeth," "Othello," "Richard III," and other Shakespearean plays. About that time he became associated with Ellen Terry and presented with much effect Tennyson's "Queen Mary" and later Goethe's "Faust." He visited America for the first time in 1883 and subsequently made several visits, in all of which he was received with marked enthusiasm. He published several papers in the *Nineteenth Century* and wrote an introduction to Pollock's translation of Diderot's "Paradox of Acting." Queen Victoria knighted him in 1894. Irving married Florence O'Callahan in 1869. His two sons, Henry Brodribb Irving and Laurence Irving, became well known as actors.

Irving, WASHINGTON, author, born in New York City, Apr. 3, 1783; died at Sunnyside, Tarrytown, N.Y., Nov. 28, 1859. At 16 he began to study law in an office, preferring this to college work on account of delicate health. His father, William Irving, possessed a choice library, to which young Irving became warmly attached, and found particular delight in studying the works of Chaucer and Spenser. His first essays appeared over the signature of "Jonathan Oldstyle" and were published in a paper called the *Chronicle*, edited by his brother Peter. He sailed for the south of France in 1804 to improve his health, and while on his sojourn of two years in Europe visited Italy, Belgium, Holland, and other countries, during which time he met Allston, Mrs. Siddons, and Kemble.

Irving returned to America in 1806 and was admitted to the bar, but, as the practice was not according to his taste, engaged in writing

WASHINGTON IRVING

and contributed to various periodicals. About this time he joined his brother William and James K. Paulding in publishing *Salmagundi, or the Whim-Whams and Opinions of Launcelot Langstaff, Esq.*, which somewhat resembled the style of Addison's *Spectator*. In 1809 he published "Diedrich Knickerbocker's History of New York," famous even today for its genial humor. Subsequently he formed a partnership with his two brothers in a business venture, but while he was in England, in 1817, the enterprise failed, and he decided to devote himself wholly to literature, for which purpose he settled in London. While there he began work on the "Sketch Book," sending installments to be published by Van Winkle at New York, but later he sold the entire work for $2,000 to Murray, a London publisher, who bought it on the recommendation of Walter Scott. Among the "Sketches" are "Westminster Abbey," "Rip Van Winkle," and "The Legend of Sleepy Hollow," all of which remain popular. While Alexander H. Everett was American minister to Spain, he invited Irving to study Spanish history, from which resulted his "Alhambra," "Conquest of Granada," "History of Columbus," and "Life of Mahomet." He became secretary of the American legation in England in 1829 and in 1832 returned to New York City, where he was received with a public banquet by the citizens. In 1842 he was appointed minister to Spain by President Tyler, at the instance of Daniel Webster, and returned to America in 1846.

Soon after returning to his native country, he established his residence near Tarrytown, on the Hudson, a region of which he wrote extensively. His home was called "Sunnyside." There he spent the closing years of his life with his nieces but remained busy as a writer until the time of his death. Irving was exceptionally popular with his contemporaries and is currently well regarded, particularly as an essayist. He had a graceful style and a somewhat Europeanized urbanity, reflecting less American influence than, *e.g.*, James Fenimore Cooper. Among the writings not mentioned above are "The Crayon Miscellany" (1835), "A Tour of the Prairies" (1835), "Tales of a Traveler" (1824), "Adventures of Captain Bonneville" (1837), "Life of Oliver Goldsmith" (1849), and "Life of Washington" (1855-59). His "Life and Letters" (1862-64) was published after his death.

Irvington (*ĕr'vĭng-tŭn*), a town in Essex County, New Jersey, adjoining the city of Newark, of which it is a residential suburb. The vicinity was settled in 1666 and by 1739 was known as Camptown; the name was changed to Irvington in 1852. Incorporation dates from 1898. Population, 1950, 59,201.

Irvington, a village in Westchester County, New York, situated on the Hudson River and the New York Central R.R., 22 m. N. of New York City, of which it is a residential suburb. Originally called Dearman when it was first settled in 1655, the village was renamed Irvington at the time of its incorporation in 1872, in honor of Washington Irving (*q.v.*), who made his home here. Population, 1950, 3,657.

Irwin (*ĕr'wĭn*), WILL (full name, WILLIAM HENRY IRWIN), writer, born in Oneida, N.Y., Sept. 14, 1873; died in New York City, Feb. 24, 1948. After graduating from Leland Stanford Univ. (1899), he became a journalist for San Francisco newspapers. Joining the New York *Sun* as a reporter in 1904, he also contributed feature articles to popular magazines and covered World War I as a war correspondent for the *Saturday Evening Post* (1916-18). A distinguished reporter and political analyst, he wrote "The City That Was" (1907), "Men, Women, and War" (1915), "A Reporter at Armageddon" (1918), and "Propaganda and the News" (1936). Possessing a versatile pen, he also published a volume of poetry, "The Hamadryads" (1904), two plays, "The Thirteenth Chair," with Bayard Veiller (1916), and "Lute Song," with Sidney Howard (1930), and several biographies, including one of Herbert Hoover (1929). His autobiography, "The Making of a Reporter," appeared in 1942. He was the brother of Wallace Irwin (1875-), also a journalist and author, and the husband of Inez Haynes Irwin (1873-), a writer of fiction.

Isaac (*ī'zăk*), meaning "laughter," a patriarch of the Hebrews, son of Abraham and Sarah, half-brother of Ishmael, and father of Jacob and Esau. He was so named because of the joy that his birth occasioned. From Genesis we learn that he was born when Abraham was 100 and Sarah was 90 years of age, that he escaped miraculously when offered as a sacrifice, that his wife, Rebecca, occasioned his blessing to be given to Jacob instead of Esau, and that he died blind at Hebron when he was 180 years old. His place of burial was in the cave of Machpelah, where Abraham, Jacob, Sarah, and Rebecca also were buried.

Isaac, the name of two Byzantine Emperors. See *Comnenus.*

Isaacs (*ī'ząks*), RUFUS DANIEL. See *Reading, Rufus Daniel Isaacs, 1st Marquess of.*

Isabella I (*ĭz-ȧ-bĕl'lȧ*), called Isabella the Catholic, Queen of Castile and Leon (1474-1504), and Queen of Aragon (1479-1504), born in Madrigal, Spain, April 22, 1451; died in Medina del Campo, Nov. 24, 1504. The daughter of John II of Castile, she was married to Ferdinand V, King of Aragon, in 1469, and on the death of her brother, Henry IV, became (1481) Queen of Castile and Leon. Though proud and ambitious, she possessed many personal charms, remarkable beauty, and a winning grace. It was her habit to attend council meetings, and she demanded

ISABELLA I

Painting by Peter Paul Rubens (1577-1640)

that her name appear on public documents with that of Ferdinand. In the management of public affairs she was prominently connected with the introduction of the Inquisition, in 1480, and the discovery of America by Columbus in 1492. To aid in the expedition contemplated by Columbus she pledged her jewels to secure the money, and to her is given the honor of making possible the enterprise that led to the discovery of the New World. She was instrumental in expelling the Moors after the conquest of Granada. At her death she required Ferdinand to confirm by an oath a promise never to marry again. She is mentioned frequently in history as Isabella the Catholic.

Isabella II, MARIA ISABELLA LOUISA, ex-Queen of Spain, born in Madrid, Oct. 10, 1830; died Apr. 9, 1904. Her mother, Maria Christina, induced her father, Ferdinand VII, to establish female succession, and at his death on Sept. 29, 1833, Isabella became Queen of Spain under the regency of her mother. Her uncle, Don Carlos, claimed the throne, on account of which a civil war resulted, and after seven years the Cortes exiled Don Carlos and his principal supporters and recognized the claims of Isabella. She became queen in fact on Oct. 15, 1843, and three years later married her cousin, Don Francisco d'Assisi. Among the events of her reign were negotiations with the U.S. for the purchase of Cuba, political differences with Chile and Peru, war with Morocco, and the annexation to Spain of Haiti and Santo Domingo. A revolution broke out against her government in 1868, which was followed by the formation of a republican government, and Isabella fled to France. On June 25, 1870, she renounced her claim to the throne in favor of her son, Alfonso, who became king in 1874. Isabella returned to Spain in 1882.

Isaiah (*ī-zā'yȧ*), meaning "salvation of God," son of Amoz. He was the most noted of the Hebrew prophets. His prophecies began in the reign of Uzziah and continued through those of Jotham, Ahaz, and Hezekiah, about 740 B.C. The history of his life is not known, but it is certain that he exercised a wide influence among the people of Judah and over the kings. It is thought he died when nearly 100 years old, shortly after Manasseh became king. His early writings threatened judgments upon the sinful, and the latter portions predict a glorious future for Israel.

Ischia (*ēs'kē-ä*), an island in the Mediterranean, situated about 6 m. w. of Italy, near the Bay of Naples. The area is 18 sq. m. It is of volcanic origin, contains many thermal springs, and is noted for its healthful climate and production of excellent wine and fruits. Monte Epomeo, the highest point, is 2,617 ft. above the sea. Among the chief industries are fruit culture, fisheries, and the entertainment of many tourists who visit it annually. Ischia is the capital and most important city, having a population of 7,008, and other towns are Forio and Casamicciola. Earthquakes are not infrequent; the most important of recent date occurred in 1883, when about 5,000 persons were killed. In the city of Ischia is a picturesque castle built by Alfonso I of Aragon, in the 12th century. Population, over 25,000.

Ishii (*ē'shē-ē*), VISCOUNT KIKUJIRO, diplomat, born in Japan, 1866; died 1945. After studying law at Tokyo Univ., he held various diplomatic posts in Europe as well as Asia, and headed Japan's Foreign Office (1915-16). Ishii was particularly interested in the treatment accorded Japanese living outside Japan. He inspected California and British Columbia (1907) to determine the cause of anti-Japanese riots which had previously occurred there. In 1917 he concluded the Lansing-Ishii Agreement concerning American-Japanese interests in China. He was prominent in the League of Nations in the early 1920's but retired from politics in 1927. He was killed during an air raid in World War II.

Ishmael (*ish'mā-ēl*), meaning "God will hear," son of Abraham and Hagar. His mother was an Egyptian who served as handmaid to Sarah. When the youth was 15, he and his mother were expelled from the house of Abraham. Subsequently they dwelt in the southern part of Palestine, where Ishmael married an Egyptian woman and reared a family of 12 sons and one daughter. Since it was foretold in the Scriptures that Ishmael would become a great nation, it is thought that the Arabs descended from him. Mohammed claimed him as his progenitor, and in the 10th century the name of Ishmaelites was assumed by a secret society of Mohammedans in Syria. The story of Ishmael is given in Genesis 16 and 21.

ISHTAR GATE, BABYLON

Ishpeming (*ĭsh'pē-mĭng*), a city in Marquette County, Mich., 15 m. w. of Marquette. It is on the Duluth, South Shore & Atlantic and the Chicago & Northwestern R.R.'s. The city is an important center of the Michigan iron-mining industry. Among the other industries are an explosives plant, a flooring mill, and a needlecraft company. Ishpeming is a leader in the promotion and development of winter sports, especially skiing. It was settled about 1857 and was incorporated in 1873. Population, 1950, 8,962.

Ishtar (*ĭsh'tär*) or ASTARTE, in the Old Testament, ASHTORETH, the most important Babylonian and Assyrian goddess. She symbolized love and fertility in all their manifold forms. Aphrodite (*q.v.*) and Venus (*q.v.*) were her counterparts in Greek and Roman mythology, respectively. The transition from one national myth to another, however, resulted in a partial change in the significance of the goddess.

Isinglass (*ī'zĭn-glăs*), a popular name for mica, a mineral consisting of hydrous aluminum silicate, which can be split into thin transparent sheets. Its specific gravity is from 2.76 to 3.1, and its rating on the hardness scale (*q.v.*) is from 2 to 3. There are many varieties of mica, which differ in color according to that of the other minerals found in them. The two micas of commercial importance are muscovite, also called potassium mica and Muscovy glass; and phlogopyte, also known as magnesium mica and amber mica. Micas are commonly found in crystalline schists, limestone, and serpentine, and occur in sheets or flakes. Where sheet mica occurs in quantity, it is mined commercially. It used to be widely used as a substitute for glass where an unbreakable transparent plate was needed. At present it is used as an insulator for electrical instruments, as a heat insulator, as window material in furnaces or refracting instruments; and in powdered form as a lubricant in oil drilling. Mica is a common mineral which occurs widely throughout the U.S., Europe, South America, South Africa, and Asia.

Isinglass is also the term used to refer to a pure gelatin obtained from the swimming bladders of fish of the *Acipenser* species, which is also known as "fish glue" or "ichthyocolla." It is used for adhesives and as a clarifying agent.

Isis (*ī'sĭs*), the principal goddess in Egyptian mythology, the sister, wife, and female counterpart of Osiris (*q.v.*). She was worshipped as the personification of the moon, as Osiris was of the sun. In statuary she is represented as a graceful woman, sometimes with cow's horns on her head and holding a sistrum, a type of dance rattle used by the Egyptians during religious rituals. Originally worshipped as a nature goddess in Egypt, she gradually took on the attributes of a universal goddess as her cult spread throughout the Mediterranean region. Considered the archetype of all goddesses, she was identified with Athena and Demeter by the Greeks. Her cult was introduced into Rome by Sulla in 86 B.C. and traveled through all parts of the Roman Empire. The worship of Isis persisted in some parts until *ca.* A.D. 560, acting as a deterrent to the early Christian teachings.

Islam (*ĭz'lăm*), a term signifying the religion of the Mohammedans (see *Mohammedanism*), originally meaning "complete submission to God." This was the doctrine which Mohammed had preached to his followers. These followers are called *Moslems,* Moslem being Arabic for "the submitting ones," *i.e.,* those accepting Islam.

The basic formula of Islamic faith is: "There is no God but Allah, and Mohammed is His prophet." This is as clear a confession of definite monotheism as the Jewish or the various Christian creeds. The Islamite includes among his holy books the Old Testament and essential parts of the New Testament. Christ is venerated as one prophet, but not as the Savior. Ethically, the submission to the will of God and to fate generally is the most characteristic trait of the Islamite.

Imam means literally in Arabic "leader," but has the added connotation of a model to be followed, the setter of a pattern. At first the word was used by the Sunnites to designate the leader of their own sect and by the Shiites to designate those caliphs whom they regard as the successors of Mohammed. Later, it was extended to the leaders of individual Moslem communities and still later to those who serve as the leaders of prayer and worship in Moslem congregations.

Mosque is the name of the Mohammedan place

of worship. It signifies at the same time, however, the whole community which is worshiping in a mosque, in the same way that church means both the individual building and a whole religious community.

Mufti means literally in Arabic an expounder of the law, but also, in fact, a Mohammedan priest. In Turkey it stood for the official head of the state religion or for one appointed to lead the religious body of a specific state (*e.g.*, the Mufti of Jerusalem, the Mufti of Iraq).

Mulla designates, like mufti, a theologian, but one who is trained more in theology than in jurisprudence.

Ulama means a theologian learned in Moslem tradition and in canon law.

The *Sunnites*, of whom there are about 150,000,000, represent the larger fraction of the Moslem world. They are the preservers of a conservatism and may therefore be called the orthodox group. They recognize only the first four caliphs, Abu Bekr, Omar, Othman and Ali (632-661), as real successors of Mohammed in temporal and spiritual power. Arabia, North Africa and Turkey are almost entirely Sunnitic. The Sunnitic branch was founded by Abu Hanifa, the Persian Moslem, in A.D. 767. He interpreted the Koran and the *Sunna*, the latter being a codification of manners, customs, and moral and legal traditions which, in relation to the Koran, holds about the same position as the Mishnah holds to the Bible in Judaism, that of a commentary.

The *Shiites* represent the other of the two leading groups among the Moslems and are found especially in Iran. In contrast to the Sunnites, they consider the caliph Ali as the vicar of God. In addition, they celebrate more festivals and attach importance to individual religious leaders. From this group *Sufism*, *Bahaism*, and other Messianic movements arose.

For a discussion of Mohammedan theology and practices, see *Mohammedanism*.

Island (*ī'lənd*), a small body of land surrounded by water. Islands differ from continents in that they are smaller in size, and range from very small islets to large tracts of land, such as Cuba and Great Britain. They were formed by corals, by volcanic action, or by being separated from the mainland through the action of waves and currents. To the last-mentioned class belongs Great Britain, which was probably separated from the continent of Europe by the action of currents. *Oceanic* or *pelagic islands* are located in the ocean, while *continental islands* lie near the continents and resemble them in geological structure. Oceanic islands, with few exceptions, are either coral or volcanic. An *archipelago* consists of a group of islands, such as the Hebrides and the West Indies. The action of waves causes many changes on the coasts of islands, such as a reduction in area.

Island Number Ten (*ī'lənd nŭm-bĕr tĕn*), an island in the Mississippi River, located in New Madrid County, Mo., near the boundary between Kentucky and Tennessee, about 40 m. below Columbus, Ky. It was so named from its position below Cairo, Ill., being the 10th of a series of islands. The Confederates under Gen. Leonidas Polk had fortified it, and after the fall of Fts. Henry and Donelson (Tennessee) it was commanded by Gen. George A. McCall with a part of Beauregard's army. Commander Foote, commanding seven Federal gunboats, bombarded it for three weeks. At the same time an army under Gen. John Pope operated against it, and the Confederates were compelled to surrender on April 7, 1862. About 7,000 prisoners and a large quantity of ammunition and supplies were captured by the Federals.

Islands of the Blessed (*ī'lənds ŏv thē blĕs'ĕd*), in Greek mythology, certain islands of the western ocean, regarded as the abode of certain favored mortals who were rescued from death by the gods. They are mentioned by Hesiod, and may be the same area called by Homer the Elysian Plain. The inhabitants were thought to enjoy an abundance of everything and to live eternally in ease and comfort.

Islay (*ī'lā*), one of the Hebrides Islands, included in Argyllshire, Scotland. It is a short distance southwest of the island of Jura, from which it is separated by the Sound of Islay. The area is 220 sq. m. Islay, the richest and most productive of the Inner Hebrides, is often called "Queen of the Hebrides." Population, *ca.* 5,000.

Isle of Pines (*īl ŏv pīnz*). See *Pines, Isle of*.

Isle Royale (*īl roi-äl'*), an island in the northwestern part of Lake Superior, located a short distance south of Port Arthur, Canada, and forming a part of Houghton County, Mich. The surface is rocky, but the island is rich in copper mines and fisheries. Low spruce and fir trees cover a considerable part of the island. It is about 8 m. broad and 44 m. long. The island and surrounding small islets constitute the Isle Royale National Park. Siskawit Bay, on the southeastern shore, is the principal inlet.

Isles of Shoals (*īlz ŏv shōlz*), a group of eight small islands off the coast of New Hampshire, about 10 m. S.E. of Portsmouth. They are a popular resort for bathing, fishing, and general recreation. Star and Appledore Islands, containing 150 and 400 acres respectively, have a number of hotels for summer visitors. On White Island there is a revolving light 87 ft. above the sea. Steamers run regularly from Portsmouth to the principal landings on the islands. Champlain discovered these islands in 1605 and they were visited by Capt. John Smith in 1614. The perma-

nent inhabitants consist mostly of fishermen.

Islip (*ĭs'lĭp*), a township in Suffolk County, Long Island, N.Y., located 40 m. E. of New York City, on Great South Bay. A well-known summer resort, it is also a fishing center. It is the site of the Central Islip State Hospital. Population, 1940, 51,182; in 1950, 71,465.

Ismail Pasha (*ĭs-mä-ēl' pä-shä'*), Khedive of Egypt, born in Cairo, Egypt, Dec. 31, 1830; died in Constantinople, March 2, 1895. Ismail was educated in Paris, and upon the death of his uncle, Said Pasha, became viceroy of Egypt in 1863, later assuming the title of khedive. Although Ismail almost brought bankruptcy to Egypt during his extravagant reign, the country made significant internal progress; the cotton market prospered enormously because of world shortages caused by the American Civil War, and the construction of the Suez Canal was supported. Extensive irrigation systems were also developed, water and gas works were built, and dock and harbor facilities were expanded. These progressive movements, however, created a heavy tax burden and in turn a public reaction which finally forced Ismail's abdication (1878) in favor of his son Tewfik. Ismail foresaw the opposition, accumulated a large fortune abroad, and left Egypt in 1879, spending most of his remaining years in Constantinople.

Ismay (*ĭz'mā*), HASTINGS LIONEL, 1ST BARON ISMAY OF WORMINGTON, army officer and diplomat, born on June 21, 1887. He studied at the Royal Military Acad. and later served in India. During World War I he served in Somaliland. During World War II he was chief of staff to the minister of defense. Ismay was made a baron in 1947. In 1951, under the Conservative government headed by Churchill, he was appointed secretary for Commonwealth relations. From 1952 to 1957 he served as secretary general of the North Atlantic Treaty Organization.

Isoamyl Acetate (*ī-sō-ăm'ĭl ăs'ē-tāt*), AMYL ACETATE, $CH_3CO_2C_5H_{11}$, also known as *banana oil, amyl acetic ether, pear oil.* Fusel oil, a by-product of the alcohol industry, which is largely composed of isoamyl alcohol, is reacted with acetic acid and a catalyst, and distilled to obtain amyl acetate. It is used as a solvent for nitrocellulose, in the preparation of lacquers and films, in the textile industry, in waterproofing compounds, and in many other products. It is highly inflammable.

Isobar (*ī'sō-bär*), or ISOBAROMETRIC LINE, a line on a weather map or chart along which all points have the same atmospheric pressure. Isobars showing arbitrarily chosen intervals of pressure indicate the distribution of pressures over a certain area of the earth at a particular time. The configuration of the isobars defines high and low pressures at the chart time; the spacing of the isobars reflects the *pressure gradient,* that is, the rate of change of pressure with distance in a given direction. Surface weather maps usually carry isobars showing instantaneous sea-level pressure distribution, but charts may be constructed showing isobars for any level in the atmosphere for which pressure data are available, and for any time period; *e.g.,* the map may show pressures over a certain area at a given time, or average pressures for a day, month, or year.

Isocrates (*ī-sŏk'rə-tēz*), Greek orator, born in Athens in 436 B.C.; died in 338. He was educated in Athens, and although timid and weak-voiced, he attained renown as a writer of orations and a teacher of rhetoric. In 392 B.C. he founded a school at Athens, where, teaching and writing, he influenced the thought and oratory of the most brilliant men of Greece. The Battle of Chaeronaea terminated unhappily for his country, and after abstaining from food for several days he died from grief. He was a friend of Plato, and wrote orations that compare favorably with those of Demosthenes.

Isolde (*ĭs-ōld'*), a legendary heroine of medieval poetry; also sometimes called *Isolt, Isond,* or *Iseult.* See *Tristan.*

Isonzo (*ē-zōn'tsō*), a river of northern Italy, in the province of Venezia Giulia, flowing 82 m. from the Julian Alps to the Gulf of Trieste, on the Adriatic Sea, and an important battle site in World War I. The first Battle of the Isonzo began June 5, 1915, and resulted in the capture of the bridgehead of Castelnuovo. The second battle took place in July and August. The third battle resulted in the winning of Oslavia, the chief city on the banks of the Isonzo, Nov. 20, 1915. The fourth battle culminated in the taking of Gorizia, Aug. 9, 1916. The fifth battle, beginning in May 1917, opened the road to Trieste, but the Italian defeat at Caporetto in the Trentino nullified the whole Isonzo campaign and forced an Italian retreat from Austrian soil.

Isothermal Lines (*ī-sō-thĕr'mal līnz*), a term derived from the Greek *isos* meaning equal + *thermē* meaning heat, which can be applied to any line indicating constancy of temperature. In meteorology, *isotherms* are lines drawn on weather charts through points which report the same temperature at a given time or the same mean temperature for a given period. In physics and chemistry, *isothermal lines* are lines on thermodynamic charts representing changes of volume or pressure of a gas under conditions of constant temperature.

Isotopes (*ī'sō-tōps*), atoms of the same element which differ in weight from each other. The different forms of atoms of the same element are known as the isotopes of that element. Eighty-three elements are known to have stable isotopes. Hydrogen has three isotopes, called protium, deu-

terium, and tritium. Deuterium oxide, known as "heavy water," is found in the proportion of one part to 5,000 parts of ordinary water. Isotopes are readily determined by means of the mass spectrometer (*q.v.*).

Isphahan (*ĭs-fä-hän'*) or ISFAHAN, an ancient city of Persia (Iran), capital of Isphahan province, on the Zaindeh River, about 210 m. s. of Teheran. For centuries it was the capital of Persia and is still an important commercial center. The chief manufactures are cotton, woolen, satin, and velvet goods, glass, firearms, earthenware, brassware, pottery, and metal jewelry. The surrounding country produces large quantities of tobacco, fruit, and cereals. Population, *ca.* 200,000.

Israel (*ĭz'rā-ĕl*), a republic lying to the east of the Mediterranean Sea, bounded on the N. by Lebanon and Syria, on the E. by Syria and Hashemite Jordan, on the S. by Egypt and the Gulf of Aqaba, and on the W. by the Mediterranean. The country contains approximately 8,050 sq. m., including all parts of former Palestine (*q.v.*) except an interior stretch, which was annexed by the government of Hashemite Jordan, and a narrow coastal strip at Gaza, administered by Egypt.

DESCRIPTION. The Negev, or southern Israel, composing almost one-third of the country, is arid and requires extensive irrigation. The remainder of the land is suitable for agricultural and industrial development, and the climate is generally similar to that of Southern California. Citrus fruit is the major agricultural product. The principal industrial products are metal, food, chemical, and wood products, leather, paper, and printing products, cut diamonds, machinery, and tools. Oil prospecting rights for the Negev have been awarded. The country has good roads, a nationwide bus network, and a small railroad system. Haifa, Jaffa, and Tel-Aviv are the principal cities and ports.

EDUCATION. The first compulsory education in the Middle East was adopted by Israel in 1949. School attendance is required of children between the ages of 5 and 13. The outstanding educational institutions include the Hebrew Univ., at Jerusalem, and the Inst. of Technology, at Haifa.

GOVERNMENT. Israel is governed under a number of basic laws which were passed in accordance with a 1950 decision to adopt a constitution by evolution. The country is a democratic republic of the Western type, with equal and nondiscriminatory rights in civil, political, economic, and religious matters for all citizens.

There is a unicameral legislature, the Knesset, of 120 members, with an executive cabinet appointed by the president. The president is elected for a five-year term by the Knesset in secret balloting. Jerusalem (*q.v.*) was declared the capital of Israel on Jan. 23, 1950. The official monetary unit is the Israeli pound, valued at $3.56 in U.S. currency (1956). The official language of the country is Hebrew, although Arabic and English also have legal status.

DAVID BEN-GURION
First prime minister of Israel

HISTORY. Israel was proclaimed an independent state by the Jewish authorities in the area on May 14, 1948, under the terms of the plan for the partition of Palestine adopted by the United Nations (*q.v.*) on Nov. 29, 1947. Five neighboring Arab states sought unsuccessfully to upset the U.N. partition decision and invaded the new state in May 1948. After defeat by the Israel army (*Haganah*), the Arab states signed truce agreements with Israel under U.N. supervision (see also *Arab League*). A provisional state council administered the government until popular elections took place on Jan. 25, 1949. The first Knesset held its inaugural meeting in Jerusalem on Feb. 14, 1949. Dr. Chaim Weizmann (*q.v.*) was elected first president of the state and David Ben-Gurion (*q.v.*), of the dominant Mapai (labor) party, became the first prime minister. Israel was admitted as a member of the U.N. in May 1949. On Weizmann's death (1952), Itzhak Ben-Zvi was named president. Ben-Gurion retired in 1953 and was replaced by Moshe Sharett, the foreign minister. Anti-Semitism in the U.S.S.R. and its satellites caused a wave of anti-Russian reaction in Israel (1953) and the rupture of diplomatic relations by the U.S.S.R. After Stalin's death the tension eased, and diplomatic relations were restored. Border tension with Israel's Arab neighbors continued, with many outbreaks of violence. The Arab countries continued to reject peace negotiations and remained adamant in their refusal to recognize the existence of Israel. Ben-Gurion, an advocate of strong measures against Arab border attacks, again became premier in 1955. Under his leadership, on Oct. 29, 1956, Israeli forces launched an attack on Egypt and occupied the Gaza Strip and Sinai Peninsula. By Nov. 5, Israeli troops were 10 m. from the Suez Canal. Pressure by the U.N.

ISRAELI FORCES IN EGYPT
During their drive to the Suez Canal in 1956

and U.S., as well as the threat of Soviet intervention, forced Israel to withdraw from the Sinai Peninsula soon afterward. Israel remained in the Gaza Strip, however, until U.N. forces arrived (Dec. 12) to enforce a truce and maintain the neutrality of the strip. Sporadic outbreaks of border violence continued.

Immigration to Israel has been unrestricted since 1950, and since 1952 any Jewish immigrant who wishes to can become an Israeli citizen. Though the number immigrating has decreased since 1952, it is still substantial, and the cost of the immigration program is a major item in the Israeli budget. It is supported by German reparation payments, contributions from world Jewry, and taxes and loans from Israeli citizens. Since 1949 the population has increased from *ca.* 1,000-000 to over 2,031,000 (1959). The non-Jewish population, chiefly Arab, is *ca.* 268,250.

Israel was long the traditional name for the collective Jewish community. Jacob, in the Old Testament, was called Israel, and his descendants were the Israelites of Egypt. Following the death of Solomon, the northern kingdom of Palestine was known, among other names, as Israel, until its destruction and the deportation of the ten tribes by the Assyrians in 722 B.C. Thus Israel, as the name of the new state, symbolizes the re-establishment of a Jewish nation. See *Zionism*.

Israëls (*ĭz'rā-ĕls*), JOZEF, painter, born in Groningen, Holland, June 27, 1824; died at The Hague, Aug. 12, 1911. He was born of Jewish parents, who sent him to Amsterdam to study art. Subsequently he studied at Paris, Brussels, and Rotterdam and in 1848 settled in Amsterdam to paint historical pictures. In 1870 he made his permanent home at The Hague. Several of his paintings, exhibited at the Paris Exposition of 1900, won him a number of medals. His best-known works include "The Shipwrecked Mariner," "Alone in the World," and "Between the Fields and the Seashore."

Issuing Bank (*ĭsh'ōō-ĭng băngk*), in finance, the central bank in any country acting as an agent for the government and custodian of the treasury, holding the gold reserves, heading the bank system, and being authorized to issue currency. In England, the issuing bank is the Bank of England; in Germany, the Reichsbank; and in the U.S., the Federal Reserve System. The functions of the Federal Reserve System (*q.v.*), however, differ from those of a European central bank in that it is not the custodian of the government gold reserves and treasury. This custodianship is the function of the U.S. Treasury Dept.

Istanbul (*ĭs-tăm-bōōl'*), former name (until 1930), CONSTANTINOPLE; ancient name, BYZANTIUM, the chief city of Turkey, in the northwest, in Istanbul province. Lying partly in Europe and partly in Asia, it occupies both shores of the Golden Horn, a 5-m. inlet of the Bosporus, at the juncture of the Bosporus and the Sea of Marmara. Commanding this passageway between the Mediterranean and the Black Sea, it is at the crossroads of commerce between Asia and Europe. It thus occupies a site of fundamental importance.

One of the world's oldest cities, it is also one of its leading ports. In Turkey it is the commercial, manufacturing, and transportation center, although the capital of the nation was moved to Ankara in 1923. The city manufactures many items, including leather products, liqueurs, tobacco, textiles, and soap, and also builds ships. While Turkey was under the Ottoman empire, trade was largely in the hands of foreigners, but it has been controlled by the Turks since 1923, when the Turkish republic was created.

Istanbul has a number of highly individual sections. The original part of the city is the ancient quarter of Stamboul; Galata is the business section; Pera is the quarter of foreign residents, and near it is the suburb of Chaskoi, inhabited chiefly by Jews. Uskudar, sometimes called Scutari, lies across the Bosporus in Asia. The city's antiquity is reflected in its magnificent mosques, notably the Hagia (Saint) Sophia. Probably the world's leading example of Byzantine architecture, it was a Christian church until the conquest (1453) of Constantinople by the Turks, who converted it into a mosque; it is now a museum of Byzantine art (see color plate *Architecture I* in Vol. XII). Three other beautiful mosques are the Mosque of Sultan Ahmed (often called the Blue Mosque), the Mosque of Suleiman, and the Mosque of the Valide Sultan (built by the mother of Mohammed IV). Equally magnificent is the Seraglio, the former palace of the Ottoman sultans, with grounds containing gardens, parks, and pavilions; now a museum, the palace contains priceless collections of crown jewels, ancient weapons, porcelain, and other art objects. Several universities and other institutions of higher learning attract students from all parts of the Middle

East and southeastern Europe. Robert Coll. and the American Coll. for Girls are maintained by Americans.

Istanbul is the seat of the Greek Orthodox Church, which accounts for the largest religious group in the city. Protestants, Roman Catholics, and Jews also form sizable segments of the population.

The city was founded by a colony from Megara about 658 B.C. and was known for years as Byzantium. Because of its commanding position between Europe and Asia Minor, it was the center of Persian, Greek, Roman, and Turkish ambition for centuries. It was occupied (A.D. 330) by Constantine the Great, who made it the capital of the Roman empire and changed its name to Constantinople (the city of Constantine). The Crusaders occupied it in 1204 and held possession until 1261, when it was taken by Michael Paleologus (Michael VIII). The Turks conquered it under Mohammed II on May 29, 1453, an event marking the extinction of the Byzantine empire. Early in World War I, the Allies tried to force the Dardanelles (*q.v.*) and to capture the city, but in 1915, after sacrificing almost 200,000 men, they had to abandon this plan. Population, 1950, 1,180,000.

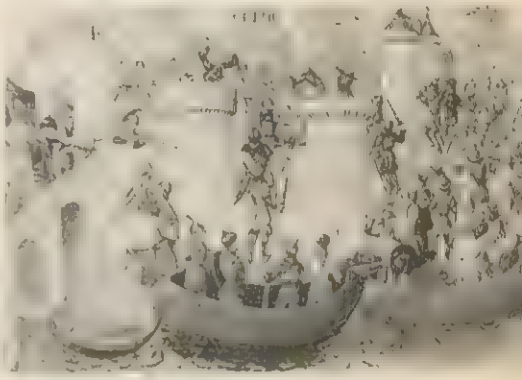
Isthmian Games (*ĭs'mĭ-ən*), one of the four great festivals of ancient Greece, celebrated on the Isthmus of Corinth, the other games being the Nemean, Olympian, and Pythian. They were celebrated in April or May of every alternate year, and consisted of boxing, wrestling, foot and chariot racing, gymnastics, throwing the discus, and contests in music and poetry. These games were of very ancient origin and were established in honor of Neptune (Poseidon). With the spread of Christianity they began to decline, but they were still celebrated in the time of Constantine and Julian. Originally, prizewinners were awarded a garland of pine leaves, but later cash awards were given to the victors.

Isthmus (*ĭs'mŭs*), a narrow passage of land connecting two larger bodies, or uniting a peninsula with the mainland. The ancient Greeks applied the name Isthmus, without any addition to the Isthmus of Corinth, which connects the Morea peninsula with northern Greece. The Isthmus of Suez, connecting Africa and Asia, and the Isthmus of Panama, connecting North and South America, are the best known isthmuses.

Istria (*ĭs'trĭ-ä*), a peninsula in the northeastern part of the Adriatic Sea, forming the territory of Istria, formerly a part of Italy. With it are included several islands, the whole territory covering an area of about 1,500 sq. m. The surface is diversified, being mountainous in the north and quite level in the south. Monte Maggiore, the highest peak, is 4,600 ft. above the sea. There are many valuable forests. The minerals include salt,

Courtesy Turkish Embassy, Wash., D. C.

VIEW OF ISTANBUL FROM THE SEA OF MARMARA



STORMING OF CONSTANTINOPLE BY THE TURKS
French miniature, 15th century

alum, and lignite coal, and the cultivated lands yield fruit and cereals. Large quantities of wine, olive oil, and lumber products are manufactured. It became a possession of Austria in 1797, was transferred to Italy in 1919, and after 1947 became a part of Yugoslavia, except for a small area on the west coast included in the Free Territory of Trieste (*q.v.*). Population, *ca.* 400,000.

Itagaki (*ē-tä-gä'kē*), TAISUKE, statesman, born in the province of Tosa, Japan, in 1837; died in 1919. He received a military education. In 1871-73 he was one of the privy councilors to the emperor, but resigned in the latter year because he advocated war with Korea. Subsequently he advocated a reorganization of the government on constitutional lines; for this purpose he organized the first political party in Japan, known as Liberals. He was minister of public works in 1878 and became minister of the interior in 1880.

Italian East Africa (*ĭ-tăl'yən*), the former Italian colonial possessions in Africa (established 1936), which included Eritrea, Italian Somaliland, and Ethiopia. For the disposition of these territories after World War II, see *Eritrea; Ethiopia; Somaliland, Italian.*

Italics (*ĭt-ăl'ĭks*), in typography, the style of lettering which mostly closely resembles handwriting because of the forward slope of the letters. This style is said to be an imitation of the handwriting of Petrarch. *This sentence is in italics.*

Italy (*ĭt'ə-lĭ*), a country of Europe, comprising chiefly the middle peninsula of the three that project from the southern coast of the continent into the Mediterranean Sea. It also includes the islands of Sardinia, Sicily, Elba, and about 70 others of more or less importance. Its length from Sicily to the Alps is about 760 m., and in width it varies from 100 to 150 m. The boundary line is formed on the N. by Switzerland and Austria, on the E. by Yugoslavia and Austria, and by the Adriatic Sea, and on the W. by France. Italy is separated from the Balkan Peninsula by the Strait of Otranto, 47 m. wide. The western shore is washed by the Ligurian and the Tyrrhenian Seas and the southern by the Ionian Sea, all being portions of the Mediterranean. Sicily, which extends almost across the Mediterranean, is separated from the mainland by the Strait of Messina. Italy has an area of 119,764 sq. m.

Description. The Apennine Mts. traverse centrally the entire peninsula and attain to heights of from 10,000 to nearly 14,000 ft. above sea level. In the vicinity of Naples the Apennines are little less than 10,000 ft., and in the northern portion the greatest height is 13,650 ft. Many of the summits are volcanic, though Vesuvius, on the Bay of Naples, is the only active volcano on the continent of Europe. Mt. Etna, in Sicily, is the highest volcanic elevation of Europe. Others of historic interest include Mt. Stromboli on the Lipari Isles. In the northern part of Italy is the valley of the Po, popularly called the Plain of Lombardy, which embraces an area of 37,000 sq. m. Much of the Italian mountain scenery is picturesque, the vegetation is abundant, and the valleys are remarkable for beauty and fertility.

Though the drainage is carried by numerous streams, the only rivers of large size are the Po and the Adige, both of which flow into the Adriatic Sea. The former is navigable to Turin, and with its tributaries affords navigation a distance of 600 m. It is fed by the snows of the Alps and the rains of the Apennines, and enters the sea by a large delta. Among the rivers of the peninsula are the Arno, the Brenta, and the Tiber, but these and others of their class flow swiftly and are subject to great changes between the dry season in summer and the seasons of heavy rains. Many beautiful lakes are located in the central and northern parts, among them Como, Bolsena, Garda, and Maggiore, the latter two extending partly beyond the northern border. A system of canals is maintained in the basin of the Po and several of the rivers have been canalized, both for transportation and for irrigation of rice lands.

The climate varies greatly on account of the extent in latitude and vast differences in elevation. In the northern part the climate is similar to that of Central Europe but in the southern part it resembles that of Africa, being affected by the dry atmosphere and the sirocco winds that blow across the Mediterranean. The mean annual temperature on the peninsula is about 57° F., while in the extreme south and on the islands it varies from 60° to 64°. The largest rainfall occurs in autumn and winter, and irrigation is necessary during the growing season in many parts of the country. The valley of the Po is particularly fertile and is one of the best agricultural regions in the world. Extensive swamps are located in different sections, such as the Pontine marshes, the Maremma in Tuscany, the Campagna of Rome, and the swampy lands of the lower Po, though some parts of these lands were recently drained and made fertile. Generally, Italy is singularly healthful. The clearness and beauty of the Italian sky is famous.

Mining. The mineral wealth of Italy is not extensive. Coal is found in limited quantities but not in sufficient quantities to meet the country's needs. Lignite coal is obtained in Tuscany and in Sardinia, and small quantities of anthracite are mined in Piedmont. Sulfur is the most important mineral, constituting about one-half of the mineral output. The most productive sulfur mines are worked in Sicily, which are among the most important in the world. A good grade of iron ore is found in the island of Elba. The zinc mines are confined chiefly to Sardinia and Lombardy. Copper is obtained in Tuscany and Piedmont, rock salt in Calabria and Sicily, and quicksilver in Tuscany. The marble quarries of Carrara are famous, but marble is also obtained in other localities, especially in Massa and Serarezza. Other minerals include small quantities of gold, silver, and antimony. The mineral waters in various localities of the Apennines and the volcanic regions are especially suited for bathing and medicinal purposes.

Agriculture. About 57,514,000 acres of the land (including *ca.* 13,494,000 of pasture land) are productive, making agriculture the leading industry. One-third of the total population over 10 years of age was employed on the land (1936 census). Wheat is the most important product and it is grown in all parts of the kingdom, but even before World War II some importing of this crop was necessary. Other important crops include rice (which was an important export prior to the war), oats, rye, barley, potatoes, hay, turnips, and vegetables. Small quantities of flax, cotton, and hemp are produced.

The breeding of livestock has not been developed to the extent of that industry in England and Germany, neither in the quantity nor in the rearing of improved grades. Horses, cattle, swine, and sheep are exported, and cattle and goats are grown largely for meat and dairying to supply the home demand. The sheep industry is confined largely to the elevated and poorer regions

DORIC ARCHITECTURE

The Temple of Neptune and the so-called Basilica (*background*) at Paestum are monuments of the 6th century B.C. when southern Italy was a Greek colony

Pictures on this page courtesy "Enit"

TEMPLE OF APOLLO IN POMPEII

FORUM ROMANUM

Excavations throughout Italy have brought to light many treasures of antiquity which have materially increased our knowledge of ancient Roman civilization

of the peninsula, while the most extensive interests in cattle are in the northern part. Poultry and eggs are exported in large quantities. Because of a favorable climate, much of the land area is devoted to the cultivation of fruits and silk cocoons. The mulberry tree is grown in connection with silk culture, and is cultivated in the central and northern sections. Lemons and oranges are grown extensively in the southern part, especially in Sicily and Sardinia. Italy produces about 2,000,000 quintals of olives per year, and has large interests in such fruits as figs, dates, apples, quinces, and melons. Grapes are grown most widely, and wine accounts for approximately one-fourth of the total money yield of agriculture. Tobacco is cultivated profitably. A large forest area is maintained, much of which belongs to the government, and practically all of the timber land is under government supervision. The trees include the olive, myrtle, mulberry, lemon, chestnut, and numerous others.

Manufactures. The absence of extensive fuel resources has somewhat limited Italy as a manufacturing country, much of its coal supply being imported. In general, the textile trades constitute the most important industry. Raw silk is produced extensively in Lombardy, Piedmont, and Venetia. Cotton and wool are spun and woven to a considerable extent. Macaroni is produced in large quantities. Considerable progress has been made in the iron and steel industry. Butter and cheese of a fine grade are produced. Other manufactures include pottery, glassware, alabaster, chemicals, leather, and straw-plaited goods. The government has a monopoly of the manufacture of tobacco and salt, and government supervision is exercised over the manufacture of powder, sugar, chicory, alcohol, and beer.

Transportation. The railroads, which totaled about 10,000 m. in 1947, were considerably damaged during World War II. This was a smaller mileage than was operated in any of the leading countries of Europe, but it was compensated for to some extent by the large transportation facilities along the coast of the Mediterranean, from which Italy secured great trade advantages with the cities of southern Europe and on the Atlantic. A fine system of highways is maintained, connected with the facilities afforded by rivers, canals, and steam and electric railways; communication with all principal cities is provided. The postal and telegraph systems are conducted by the government, and lines of telephones under public and private ownership afford excellent facilities.

Silk, wine, sulfur, raw flax, eggs, fruit, and olive oil are the chief exports. Among the lead-

ing imports are coal, wheat, raw cotton, machinery, fish, and raw wool. In 1955 imports amounted to $2,706,000,000 and exports to $1,857,000,000.

Population. The people of Italy are generally short of stature and dark-skinned. In the north, many show Germanic traces from the Gothic invasions; in the south, traces of the ancient Greek colonists. Foreign inhabitants include principally French, Albanians, Greeks, Slavs, Germans, and Spaniards. There was heavy migration between 1890 and 1926, but in the latter year the government, in the interest of nationalism, controlled emigration.

Rome, on the Tiber River, is the capital and largest city. Other important cities are Naples, Milan, Turin, Palermo, Genoa, Florence, Bologna, Messina, Venice, and Ravenna. In density of population, Italy ranks third among the nations of Europe, exceeded only by Belgium and The Netherlands. Population (1956 est.), 48,951,000.

Language and Literature. The Italian language, like the other Romance languages, is derived from the spoken language of the ancient Romans—the common or "vulgar" (vulgate) Latin. Unlike French, Spanish, and Provençal, however, its development into a national literary language was slower, chiefly because the Italians remained more faithful to their Latin tradition. Indeed, not until the 10th century can Italian words in legal documents be recognized as different from the Latin. Slowly, many words from non-Latin sources—Germanic, Greek, Arabian, Celtic—have crept into the Italian language. Further, the influence of nearby French and Provençal has led to the survival of different forms from the same Latin basis—*e.g., domina* (lady) is continued by *donna* and (through French) by *dama*. The Italian literary language came, over the centuries, to be based upon the Florentine (or Tuscan) dialect. Besides the national language, Italians still use many dialects, which vary so widely that a Piedmontese and a Sicilian speaking in their own dialects would not understand each other. Much fine literature, however, exists in these various dialects.

The first literary attempts in the Italian vulgate were made in Palermo at the court of Emperor Frederick II (1194-1250), who gathered about him poets, troubadours, and artists, thus creating the Sicilian school, which included, among others, his son Manfred, Ciullo d'Alcamo, and Giacomo da Lentini. All of these, however, were greatly influenced by the style of the French minstrels.

Toward the end of the 13th century, there developed in Tuscany a new school under the inspiration of Guido Guinicelli (including Guido Cavalcanti, Lapo Gianni, Dino Frescobaldi, and Cino da Pistoia), who wrote sonnets expressing noble sentiments around woman as a symbol of celestial love. In his *"Vita Nuova"* ("New Life"), Dante Alighieri (1265-1321) describes his love for *Beatrice* in accordance with this concept. His "Divine Comedy" embodies a faithful representation of the life, morals, religion, and beliefs of the times. Dante also wrote on philosophy and politics and on the need for an Italian literary language.

Francesco Petrarca (anglicized *Petrarch*, 1304-74) is famous for his lyrics expressing his love for his idealized *Laura*. He was the foremost poet of his day, and his sonnets (which set a style for English poets, among others, from Milton onward) remain unequaled. Giovanni Boccaccio wrote a geographical dictionary, histories, and biographies of famous men and women in Latin. His masterpiece is the "Decameron," a prose work containing a wide variety of tales which have served as models for many later writers (*e.g.*, Chaucer, Schiller, Lope de Vega, Keats).

The Renaissance spirit created other literary genres: *e.g.*, the political-minded "Letters" of St. Catherine of Siena (1347-80); the treatise "On the Family" of Leon Battista Alberti (1406-72); a defense by Pietro Cardinal Bembo (1470-1547) of the use of Italian instead of Latin; and the beginnings of the poetry of chivalry with the *"Morgante"* of Luigi Pulci (1432-84) and the *"Orlando Innamorato"* of Matteo Maria Boiardo (1441-94). Adventure, love, chivalry, and fantasy were combined in the *"Orlando Furioso"* of Ludovico Ariosto (1474-1533). Epic poetry attained its highest perfection with Torquato Tasso (1544-95), whose *"Gerusalemme Liberata"* ("Jerusalem Delivered") deals with the rescue of the Holy Sepulcher by the knight Godfrey of Bouillon.

Important contributions were also made in politics, natural sciences, and philosophy: *e.g.*, by Niccolò Machiavelli (1469-1527), political philosopher, in "The Prince"; Baldesar Castiglione (1478-1529), philosopher of manners, in "The Courtier"; Galileo Galilei (1564-1642) and Giordano Bruno (1548-1600), astronomers and scientists; and Giambattista Vico (1668-1744), who initiated the study of the philosophy of history. The great poet of the 17th century was Giovanni Battista Marino (1569-1625), whose *"Adone"* is considered the great poem of the era.

Italian literature had a new revival in the 18th century. Pietro Trapassi, called Metastasio (1698-1782), wrote many melodramas, and Carlo Goldoni (1707-93) wrote popular comedies about the *bourgeoisie*, shopkeepers, and the minor nobility. *"Il Giorno"* ("The Day"), by Giuseppe Parini (1727-99), is a satirical poem aimed at the Milanese minor nobles. Vittorio Alfieri (1749-

1803) gave Italy the tragic drama, including "Saul," "Antigone," and "Agamemnon." Other poets of this generation are Vincenzo Monti (1754-1828) and Ugo Foscolo (1778-1827).

In the 19th century, Giacomo Leopardi (1798-1837) wrote lyrics which remain unexcelled. The great novel of the century is *"I Promessi Sposi"* ("The Betrothed"), by Alessandro Manzoni (1785-1873). Giosuè Carducci (1835-1907), poet and professor of literary history, was the first Italian to receive the Nobel Prize for literature (1906). Giovanni Pascoli (1855-1912) is remembered as a poet of small and humble things. Gabriele D'Annunzio (1863-1938) is unmatched for the music of his poems and for the beauty of his imagery. The human mind and personality are explored in the challenging plays of Luigi Pirandello (1867-1936), another Nobel Prize winner (1934).

Contemporary writers are much concerned with the social, economic, and political problems created by past generations and the current century. Interest in such problems distinguishes the novels of Grazia Deledda (1871-1936; Nobel Prize, 1926). Other outstanding modern novelists and short-story writers are Giovanni Verga, Antonio Fogazzaro, Salvatore Di Giacomo, Giuseppe Borgese, Matilde Serao, Aldo Palazzeschi, Corrado Alvaro, Giovanni Papini, Elio Vittorini, Vasco Pratolini, Carlo Levi, Riccardo Bacchelli, and Ignazio Silone. Many of these authors, and particularly Alberto Moravia and Cesare Pavese, have become quite popular abroad as well as in Italy.

The younger poets of the 20th century seem to be in a state of despair, although they also note the need for a more intimate and real contact with life. Dino Campana, Guido Gozzano, Filippo Tommaso Marinetti, Giuseppe Ungaretti, Eugenio Montale, and Salvatore Quasimodo are considered the best poets of the present generation.

Art. From Roman times until the 19th century, Italy was considered the leading European country in the realm of art. Out of its Roman heritage developed the early Christian art and Byzantine art, still documented by magnificent basilicas, baptisteries, and mosaics. During the Middle Ages, the Romanesque and Gothic (*qq.v*) styles were reflected in specific national developments in architecture and in flourishing schools of painting, especially in Florence and Siena (*qq.v.*). After 1400 the Italian Renaissance developed (see *Botticelli; Bramante; Donatello; Ghirlandaio; Michelangelo; Raphael; Titian*), centering first in Florence and Venice (*qq.v.*) and later (after 1500) in Rome (*q.v.*). Through the following baroque (*q.v.*) period, the Church of St. Peter (*q.v.*) was erected and its influence was felt upon all future architecture in Europe.

PISA

The Leaning Tower, begun in 1174, and the Cathedral in the background

In the 18th century only Venice produced significant paintings (see *Guardi; Tiepolo*), while in the 19th and 20th centuries Italy yielded her leadership in art to France. See also *Architecture; Art.*

Education. Elementary education is free and compulsory for children between the ages of 6 and 14, and there is provision for secondary education. Italy has numerous universities, at Pisa, Padua, Genoa, Naples, Rome, Palermo, Bologna, and elsewhere; some of these are among the oldest in Europe. Although the constitution provides for religious freedom, the dominant religion is Roman Catholicism. The pope resides at Vatican City, geographically though not politically a part of Rome.

Government. Italy has been a republic since June 1946. The present constitution went into effect on Jan. 1, 1948. The President of the Republic is elected for a seven-year-term by the National Assembly. Parliament consists of a chamber (lower house) and senate (upper house); members of both are elected for five years. The constitutional court functions somewhat as does the U.S. Supreme Court. Military service is compulsory for men from 21 to 39 years of age. The Italian peace treaty, after World War II (1947), limited the Italian army to 250,000 men, the navy and air force to 25,000 each; but these restrictions have since been eased.

Colonies. Italy renounced all rights to her colonies in the peace treaty of 1947, and the final disposition was settled by the U.N. General Assembly in 1949. Libya was declared to be independent by Jan. 1, 1952; Somaliland was put under a ten-year Italian trusteeship; and a special

commission was appointed to determine the future status of Eritrea. See also *Ethiopia*.

History. The early history of Italy is included in that of Rome (*q.v.*). Italy was at first peopled by various tribes, including the Etruscans, Oscans, Latins, Umbrians, and Sabines. The Latins, centered around Rome, gained control over the rest and gave their name and language to the entire peninsula. The history of post-Roman Italy begins in 476, when the Gothic invaders proclaimed Odoacer (*q.v.*) king of Italy. In 493, Theodoric the Great, king of the Ostrogoths, won control and gave Italy a better government than had been experienced since the start of the decline of Rome. The Eastern emperor, Justinian (*q.v.*), vanquished the Ostrogoths in 552, and for a short time Italy was governed from Constantinople. The Germanic Lombards secured dominion in 568, and in 800 Charlemagne (*q.v.*) became the ruler of Italy.

The Carolingian dynasty gave eight kings to Italy, reigning until 962, when Otto I of Germany, on reducing Berengar II of Italy to vassalage, was crowned emperor of Italy. The Holy Roman Empire which Otto established and which was destined to endure at least in form until abolished by Napoleon in 1806, embraced Germany and Northern Italy; it did not include France. For more than two centuries, German kings theoretically governed the northern part of the peninsula. Many wars for supremacy occurred periodically between the popes, the emperors, and the independent city-states. The contest between the Guelphs (opponents of the emperors) and Ghibellines (upholders of imperial authority) in Italy was the pivotal event of the 12th century. Hostilities began soon after the election of Lothair II in 1125 and were renewed under Innocent III. Frederick Barbarossa, elected in 1152, met the determined opposition of the popes. In 1154 he entered Italy to establish his power and, though at first successful, was finally hopelessly defeated by the League of Lombard cities at Legnano (1176). The peace, concluded at Constance in 1183, resulted in a complete triumph for the League and the pope. The Lombard towns regained their influence, although they recognized the emperor's overlordship. Genoa, Venice, Milan, and Pisa initiated and displayed municipal life crowded with political and cultural ambitions. In the 13th century Rudolf I of Hapsburg, German king and head of the Holy Roman Empire, abstained from interference in Italy and in 1278 confirmed the territorial claims of the popes, thus placing the pope in the position of a temporal ruler. In 1310, after his election as emperor, Henry VII of Luxemburg crossed the Alps and again raised Ghibelline hopes, but his gains were short-lived and the cause of the Ghibellines was lost.

Meanwhile, the strife of the Lombard cities for superiority expanded into open warfare. Between 1352 and 1381 Venice and Genoa fought for power in the Mediterranean, both exhausting their accumulated riches. In a new struggle with Genoa at the turn of the 14th century, Venice, which had also been at war with the Carraresi of Padua and the Scaligeri of Verona, embarked on a career of conquest which led to her ascendancy in Italian affairs. A new phase of her history began after the fall of Constantinople in 1453 when she broke with the Eastern empire and defended Christendom against the Turkish drive.

Florence extended her domain over the Tuscan cities and gained access to the sea in the 14th cen-

THE FOUNDING OF MODERN ITALY

The historical scene in which Garibaldi salutes Victor Emmanuel II of Piedmont as "King of Italy" is recorded in this painting by C. Ademollo (1825-1911)

Courtesy Bettmann Archive, N. Y.

tury. She ranked highest under the dictatorship of Cosimo de' Medici (*ca.* 1450), who combined corrupt "practical politics" with patronage of arts and letters. The efforts of the Dominican preacher Girolamo Savonarola to make the Florentine republic a model Christian commonwealth failed utterly. Hated by the Medici, as well as by Pope Alexander VI, for both personal and political reasons, he was declared guilty of heresy and executed.

Whereas the papacy, the republics of Venice and Florence, the duchy of Milan, and the kingdom of Naples controlled Italy during the 14th and 15th centuries ("five powers"), the 16th century gave the German emperors appointive power over several of the states. After the siege of Pavia (1525) which resulted in the submission of Francis I of France to Charles V, the greatest monarch of the Austrian dynasty, and which was followed by the capture of Rome and the captivity of Pope Clement VII (1527), Charles consolidated by administrative measures what he had won by force of arms. The Peace of Cambrai (1529) deprived France of Lombardy, and in 1530 Clement VII, freed after seven months of seclusion, crowned the victor at Bologna as king of Lombardy and emperor of the Romans (the last papal coronation of a German emperor).

Philip, the son of Charles, was recognized as undisputed sovereign by the Treaty of Cateau-Cambresis, giving the Hapsburgs undisputed control. The establishment of the order of the Jesuits and the Inquisition strengthened the papacy, and in 1684 Venice conquered the Peloponnesus. However, the Peace of Utrecht, in 1713, gave Austria supremacy in Milan, Naples, and Sardinia. After prolonged wars, the spirit of nationalism in Italy remained crushed and apathetic until the rise of the French Revolution reawakened it.

In 1796 Napoleon invaded Italy, was successful against the Austrians in the Battle of Marengo in 1800, and five years later crowned himself king of Italy. Soon after, several districts were annexed to France. The following year, in 1806, Joseph Bonaparte became king of Naples, and, two years later, was succeeded by Murat. Napoleon held undisturbed sway in Italy until 1814, when Murat and Austria cooperated against Napoleon, but Murat was dethroned and by court-martial was sentenced to death. In 1815 the Congress of Vienna restored Italy to its former state. At the same time the house of Savoy received Sardinia, the Hapsburg-Este family secured several principalities, and the wife of Napoleon, Maria Louise, received Parma. Lucca was given to the duke of Parma, the Austro-Lorraine dynasty received Tuscany, the pope was restored in the papal states, the Bourbons received Naples, and Monaco and San Marino were made independent.

These conditions existed more or less undisturbed until the Revolution of 1848, which broke out in Milan and Sicily, and the Italian people again became involved in a war for national union and independence. The pope at first favored the movement, but his later withdrawal of support seriously weakened it. In 1849 the pope fled from Rome, a republic was proclaimed, and Giuseppe Mazzini became president. In 1850, however, a French army restored the pope and other sovereigns, thus nullifying the revolution. Victor Emmanuel II, king of Piedmont, who aided the national cause, was supported by Cavour of Sardinia and Giuseppe Garibaldi. After Austrian armies were defeated at the battles of Magenta (June 14, 1859) and Solferino (June 24), the struggle ended with the Peace of Villafranca. Victor Emmanuel was subsequently declared king of Italy by the Italian parliament (February 1861).

In the War of 1866 between Prussia and Austria, Italy was allied with the former, and, after the victory at Sadowa, Venetia was annexed by treaty to Italy, and about the same time the capital was removed from Turin to Florence. In 1867 the national party under Garibaldi made an attack upon Rome but was opposed by the papal army. Napoleon III, involved in the Franco-Prussian War, withdrew his troops, thus enabling Victor Emmanuel to enter Rome (Sept. 20, 1870) and assure the emancipation of Italy. The pope, who was given a yearly donation of $622,500, retained possession of the Lateran Palace, the Vatican, the Church of Santa Maria Maggiore, and the villa of Castel Gandolfo. United Italy entered enthusiastically upon an era of nationalism, developed internal improvements, and earned a substantial position among the major powers of Europe. Victor Emmanuel died in 1878 and was succeeded by his son, Humbert I, who was assassinated in 1900 and was in turn succeeded by his son, Victor Emmanuel III. Italy joined Germany and Austria in the Triple Alliance in 1883. In 1911, after a war with Turkey, Italy annexed Tripoli. In 1915 it repudiated the Triple Alliance and entered World War I on the side of the Entente Allies, which, in a secret treaty, had promised Italy territory to be taken from Austria-Hungary. At the close of the war, Italy received South Tyrol, a portion of the reparations to be paid by Germany, and concessions in Istria and Asia Minor. But Italian hopes of reaping substantial territorial benefits from the war were disappointed. Not only had the peace treaties failed to award the much coveted city and province of Fiume to Italy, but when Gabriele D'Annunzio, soldier and poet, seized the town at the head of volunteers and some regulars (September 1919), Yugoslavia, shielded by President Wilson's policy, blocked the acquisition; by the

Treaty of Rapallo, signed with Yugoslavia in November 1920, the Italian government recognized the independence of the Free State of Fiume, which was, however, incorporated into Italy (1924). Albania succeeded in forcing back the Italian troops which had "protected" the country during the war and regained political liberty. The former colonies of Germany in Africa were allotted as mandates to the British Empire, France, and Belgium. Ambitious dreams to make of the Adriatic an Italian lake and to obtain raw materials from Africa were shattered.

Along with political and military humiliations, the economic condition of Italy grew steadily worse. The national deficit and the cost of living increased, while the lira fell to less than a third of its face value. General dissatisfaction with the government enabled the Socialists to double their seats in the chamber of deputies (November elections, 1919). Throughout 1920, rural riots, industrial strikes involving the seizure of factories by the workers, street brawls between nationalistic bands and left-wing extremists in Rome, Trieste, Genoa, and other cities, troubled the internal peace of the peninsula. Although the crisis quieted down, the fear of Bolshevism, as advocated by radical elements, welded the propertied and middle classes, the clergy, and factions of moderate Socialists together for the common purpose of helping establish a firm national state. In the elections of May 1921 the Socialists suffered a setback. In November the hour was ripe for transforming the *"Fascio di Combattimento"* (Union of Combat, which Benito Mussolini had founded in 1919 and strengthened early in 1921 by inclusion of many of D'Annunzio's legionaries) into a pronounced military organization, the Fascist party. In the fall of 1922, Mussolini, whose "black shirts" had occupied most of the prefectures, power plants, post offices, and railroads in Northern and Central Italy, undertook his "march on Rome," demanding the premiership. Premier Luigi Facta resigned on Oct. 27, King Victor Emmanuel refusing to proclaim a state of siege. Instead, he entrusted Mussolini with the formation of a new ministry. Once premier (and also minister of foreign affairs and the interior) *Il Duce* (the leader) asked parliament for, and was granted, full powers to reform both administrative and social conditions. The period of virtual dictatorship ended before 1924. What followed was a complete inundation of Fascists in all governmental offices, pervading each department with loyal party members. Parliament, too, became solidly Fascist after the enacting of an election law bound to favor the Fascisti. In April 1924, over 60 per cent of the votes sustained Mussolini and his followers. The murder of Socialist Giacomo Matteotti for denouncing Fascist excesses (June) provided Mussolini with an opportunity of doing away with local chiefs and other personalities of his own party who opposed him, thus gradually making himself supreme. Parliament was deprived of the right to initiate legislation and impelled to permit a government by decree; Mussolini assumed sole responsibility to the king. The press was strangled by censorship. Secret societies, free-masonry, and (in 1926) all opposition parties were abolished. In the same year a Collective Labor Relations Law introduced the idea of a corporate state, ruled by syndicalism of Fascist brand. Thirteen syndicates, grouped into corporations representing the various industries, were given power over all workers and employees, members and nonmembers alike, to bind them by collective contracts covering wages, hours of labor, etc. Strikes and lockouts were prohibited. The labor sections of the courts of appeal were authorized to settle disputes. In 1927 a "Charter of Labor" promulgated the ascendancy of the nation over individual rights. An electoral reform law (1928) was related to the political and syndicalist system in that it permitted the Fascist Grand Council to accept or reject candidates. The question laid before the Italian people in the March elections in 1929 read: "Do you approve the list of deputies chosen by the Council?" Only about 0.15 per cent of the voters answered in the negative. A second "plebiscite" in March 1934 had similar results. In the same year Mussolini, also chairman of the National Council of Corporations (established in the early thirties and composed of representatives of the syndicates and government officials), organized 22 guilds, designed to regulate the economic metamorphosis of particular raw products into finished articles, and made himself president of each of these corporations. In November the Duce opened Italy's first National Assembly of Corporations, while the final step in completing the pyramidlike system of the corporative state was taken in March 1939, when the Chamber of Fasces and Corporations replaced the chamber of deputies. A new Civil Code, endorsing anti-Jewish decrees, was enacted in Summer 1939, flaunting once more the Fascist concept of the state prerogative.

In the diplomatic field Mussolini displayed, and often paraded, a greater flexibility than in his regimented domestic policy. The result of so many about-faces and of his aggressive shrewdness was a sinuous course of events indeed. Mussolini inherited the "Roman question," a long-standing controversy between the Roman Catholic Church and the Italian state, concerning the annexation of the last territorial possessions of the papacy by the state during the Franco-Prussian War of 1870-71. As early as 1926, Mussolini expressed his desire for reconciliation, and on Feb. 11, 1929, a treaty, concordat and financial convention were signed by Mussolini and by Cardinal Gasparri for

Chinese - Mongoloid Race

Eskimo—Mongoloid Race

SIGNING OF THE LATERAN TREATIES, 1929

Cardinal Gasparri, Secretary to Pope Pius XI, and Mussolini

Pope Pius XI. Italy recognized the sovereignty of the pope over the state known as Vatican City and recognized the Catholic religion as the only state religion; the government agreed to enforce the canon law relating to faith, morals and marriage; religious instruction was to be compulsory. The pope received $91,875,000 in settlement of all financial relations with Italy in consequence of the fall of temporal power. In return, the Holy See declared the "Roman question" settled and recognized the kingdom of Italy. In 1932 anti-Communist Italy concluded, for economic reasons, a treaty of friendship, nonaggression, and neutrality with Soviet Russia. In June 1933 the Four-Power Pact, inaugurated by Mussolini "in the interest of European peace," was signed by Great Britain, France, and Germany which shortly before had fallen under the Hitler sway. The so-called Rome Protocols of 1934 brought about reciprocal trade agreements and an Italian guarantee of the independence of Hungary as well as of Austria, then threatened by Nazi German attempts at annexation. Hitler's visit to Mussolini at Venice in June 1934 did not sway the Duce in his opposition against German policy in Central Europe, as was proved by the accord with France in January 1935, in which Italy promised to support France against Germany's rearmament, and by Italy's joining the "Stresa Front" (April 1935) with England and France against manifold German violations of the Versailles Treaty. Internal opposition and economic strain made diversion of the Italian people necessary, and, in October 1935, Italy attacked Ethiopia, a country tied to her by trade and political pacts, violating her obligations toward the League of Nations, of which she was a member. The campaign in Ethiopia was as successful as might be anticipated in a war between a modern army and the semiprimitive Ethiopians. Initial hostility on the part of Great Britain, coupled with economic sanctions applied by the League of Nations, was followed by attempts at appeasement by the British foreign secretary, Sir Samuel Hoare, and Pierre Laval, of France. These attempts, however, roused public criticism in England and failed. The Italians, rejecting all proposals for negotiated terms, continued their advance, conquered the last Ethiopian army on March 2, 1936, and annexed the country. Ethiopia was declared an Italian colony, with Addis Ababa the capital. King Victor Emmanuel was proclaimed emperor (May 1936), and in June the colony of Italian East Africa, comprising provinces of the conquered country, Eritrea, and Italian Somaliland was formed. The League sanctions, counteracted and almost annulled by a few dissenting countries, particularly Germany (not a member of the League), who supplied Italy with vital materials, came to a formal end on July 15. Mussolini, now lined up with Germany, later formed the so-called Berlin-Rome Axis, providing for joint action in support of mutual interests, an agreement which turned out to be of far-reaching influence. The two countries first presented a united "political front" during the Spanish Civil War (see *Spain*). While allowing Germany to spread her trade throughout the Danubian and Balkan regions, Italy won a free hand in her expansion policy in the Mediterranean, and in November 1937, following Mussolini's visit to Germany in September, Italy backed Germany politically by adherence to the then one-year-old German-Japanese Anti-Comintern Pact. The axis was proved especially advantageous to Germany by Italy's passive role during Germany's absorption of Austria (March 1938). In April 1939 Italy gained a base of operations in the Balkans by marching into Albania and dethroning her king. In May she concluded with Germany a military assistance pact. However, this pact did not become effective immediately upon the outbreak of World War II (September 1939). Feeling under no obligation after Hitler had rejected an Italian proposal to

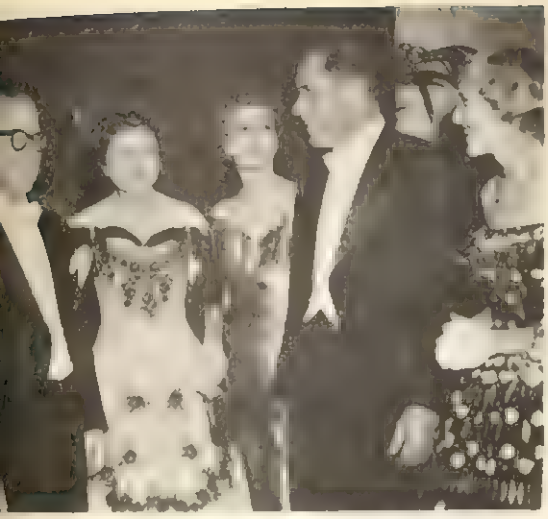
arbitrate in Germany's conflict with Poland, Italy not only adopted a policy of "nonbelligerency," but also ousted pro-German ministers from the government and began to compete with German trade in the Balkans. The collapse of France and England's apparent weakness in resisting the Nazis, however, converted this attitude to active warfare, and Italian troops were sent against France (June 10, 1940). Two weeks later a Franco-Italian armistice was signed. In October 1940 Italian troops invaded Greece. Being poor in foodstuffs, Italy had increasingly to accede to German demands for minerals and especially for workers, bowing more and more to the political leadership of her ally. Entangled in the war with Soviet Russia since June 22, 1941, the Fascist regime disintegrated gradually until its final collapse in the summer of 1943. Outflanked and defeated in the Tunisian and Tripolitanian campaigns, finally routed and destroyed or captured by the Allies, the Italians lost their African empire. The Italian island of Pantelleria surrendered on June 11, 1943, after prolonged bombardment by air. On July 19 Allied planes strafed Rome, an event that contributed decisively to the downfall of Mussolini, who was replaced (July 25, 1943) by Marshal Pietro Badoglio. Badoglio first attempted to continue as a partner of Nazi Germany, but after the conquest of Sicily (Aug. 17) and the armistice with the Allies (Sept. 3) he moved his government behind Allied lines and prepared for the complete abolition of Fascist legislation. The armistice stipulated unconditional surrender of the Italian army and navy, the withdrawal of Italy's armies of occupation from the Balkans, France, and other territories, and the utilization of all the means of the country for the war against Germany. On Sept. 19 the Italians seized Sardinia for the Allies. German resistance in Naples was broken on Oct. 1, after the Americans had smashed a German line east of the city and the British had captured Foggia (Sept. 27). In recognition of Italy's formal declaration of war against Germany (Oct. 13), an Anglo-American-Russian joint statement recognized her as a cobelligerent.

Allied progress up the Italian peninsula was slowed down by bad weather and difficulties of terrain. Not until May 18, 1944, did Cassino, bastion of German defenses in southern Italy, fall to the British and Poles. Rome and Northern Italy were still in the grip of the Nazis and the puppet government of "Fascist Republicans" which Mussolini had set up in September 1943, after his liberation from government captivity by German parachutists. His rule in Northern Italy, however, lasted 1½ years only, for on April 28, 1945, Mussolini was executed by revolting partisans. The Germans strongly resisted the Anglo-American armies but were finally forced to surrender (May 2, 1945) after a short Allied offensive and an uprising of partisans behind the front. Italy signed a peace treaty ending World War II in Paris, Feb. 10, 1947. In accordance with the treaty, Allied occupation troops were withdrawn, Trieste (*q.v.*) made a Free Territory, the Dodecanese Islands (*q.v.*) returned to Greece, Franco-Italian border districts were ceded to France, and parts of Venezia Giulia went to Yugoslavia.

After the fall of Rome (June 4, 1944), Victor Emmanuel turned over his power, though not his throne, to his son, Crown Prince Humbert, and a non-Fascist cabinet was formed. On May 9, 1946, Victor Emmanuel abdicated in favor of Humbert, in an effort to preserve the monarchy. However, in the plebiscite of June 2-3, a majority voted for a republic, and on June 13 the Italian kingdom came to an end, with Humbert II going into exile. A national assembly was elected to draft a republican constitution, effective Jan. 1, 1948. Succeeding republican governments, mostly under Premier Alcide de Gasperi (*q.v.*), concentrated on economic recovery. The country, politically divided, was a battleground in the Communist struggle to dominate Europe. In order to support a democratic government, and to stave off starvation, the U.S. provided money and food and in 1948 included Italy in the list of recipients of the European Recovery Program. Italy also signed the North Atlantic Treaty (*q.v.*) and the Schuman Plan aimed at pooling the coal and steel production of Western Europe (ratified June 16, 1952).

Although the election of April 1948, the first under the new constitution, had inflicted a decisive setback to the political Left, Communist-inspired disorders continued to appear. The political scene was further complicated by the formation of an extreme right-wing movement, the neo-Fascist *Movimento Sociale Italiano,* and the disposition of the Italian colonies (see individual articles). However, the general economic situation showed improvement in connection with E.R.P. aid measures. Italy in 1950 was named administrator of Italian Somaliland by the U.N., under a ten-year trusteeship. The former Italian colony of Eritrea was united with Ethiopia on a federal basis.

Economic difficulties, including a growing population, a continued housing shortage, and a persistent unemployment figure of *ca.* 2,000,000, continued to trouble the nation. A new voting procedure of combined slates gave pro-Western parties considerable extra strength in May and June elections in 1951, but economic problems forced a cabinet reorganization in July. Extreme right-wing parties showed increased strength in provincial and municipal elections in May 1952, winning control in Naples, Bari, and several other



Courtesy United Press Photos

FIRST ITALIAN PRESIDENT TO VISIT THE U.S.

President Giovanni Gronchi made a state visit to the U.S. in 1956. A Christian-Democrat elected to the presidency in 1955, with Communist support, Gronchi made his high office a center of Italy's political life. Above (*left to right*): President Gronchi, Signora Gronchi, Mrs. Nixon, Vice President Richard M. Nixon, Clare Boothe Luce, then U.S. ambassador to Italy

cities. Russia's veto of Italy's application for U.N. membership caused Italy to nullify its 1947 peace treaty with the Soviet Union (which included provisions for arms limitations).

In June 1953 the five-year coalition of Center parties led by Premier Alcide de Gasperi, of the Christian Democratic party, was defeated. De Gasperi was shortly succeeded by Giuseppe Pella, also a Christian Democrat, who leaned much farther to the Right than De Gasperi and relied heavily upon the support of the Monarchists. Pella's government fell in January 1954 and was succeeded by that of Christian Socialist Mario Scelba, who relied for support upon the right-wing Socialists. Long friction with Yugoslavia and the West over the disposition of Trieste reached a crux in 1953 but was ended in October 1954 by an accord with Yugoslavia, which gave the city itself to Italy and most of the outlying territory to Yugoslavia.

In 1955 Giovanni Gronchi, leader of the left wing of the Christian Democrats, was elected president, and Antonio Segni, from the same political group as Gronchi, was made premier after Scelba failed to obtain support from his own party after the defeat of minor Centrist parties in the June elections. In December 1955 Italy was admitted to the U.N. Italy, with five other Western European nations, approved a proposed European atomic-energy pool ("Euratom") and the creation of a common European market within ten years (ratified March 25, 1957). Centrist parties won in provincial elections in May and June 1956. The upheavals in the Communist world in 1956 resulted in calls in Italy's left-wing groups for a stronger "nationalist" focus for that party. Another cabinet reorganization replaced Premier Segni by Adone Zoli, also a Christian Democrat (May 19, 1957).

Itch (*ĭch*), a contagious disease of the skin. It is caused by the itch mite, a microscopic insect that burrows within the epidermis. The eggs are laid in the skin by the female, hatch in about ten days, and give rise to the disease.

Ithaca (*ĭth'ȧ-kȧ*), county seat of Tompkins County, New York, at the southern end of Cayuga Lake, 46 m. s.w. of Syracuse. In a rich farming and dairying district, Ithaca is on the Lehigh Valley and the Delaware, Lackawanna & Western R.R.'s. Points of interest include the courthouse, hospitals for tuberculosis and infantile paralysis, and the campuses of Cornell Univ. (*q.v.*) and Ithaca Coll. Among the manufactures are adding machines, leather goods, tools, firearms, power drive chains, and pottery. The community was settled in 1789; incorporated as a village in 1821, it was made a city in 1888. Population, 1940, 19,730; in 1950, 29,257.

Ithake (*ē-thä'kē*), an island of the Ionian group, just west of Greece. It is 16 m. long and 4 m. wide (area, 38 sq. m.). The capital is Vathy (population, 5,052). The principal products are olives, wine grapes, currants, and fish. Population, 1950, 7,083.

Ito (*ē'tō*), PRINCE HIROBUMI, statesman, born in Choshu, Japan, Sept. 2, 1841; assassinated (by a Korean patriot) in Harbin, Manchuria, Oct. 26, 1909. The son of a Japanese nobleman, he was educated in England and later traveled widely in Europe and America, studying military, naval, economic, and financial problems. He held various public offices, including the premiership (1886-89, 1892-96, 1898, 1900-01). He drafted a Western-style constitution limiting the powers of the emperor (adopted 1889) and later was special adviser to the emperor during the Russo-Japanese War (1904-05), resident general in Korea (1905-09), and president of the Japanese privy council (1909).

Ittner (*ĭt'nĕr*), MARTIN HILL, chemist, born in Berlin Heights, Ohio, May 2, 1870; died in Jersey City, N.J., April 22, 1945. After graduating from Washington Univ. (1894), he went to Harvard (Ph.D., 1896), and thence, for the rest of his life, to the Colgate Co. Ittner developed many patents for the manufacture of soap, glycerin, and related products, and won many awards for his chemical researches.

Iturbi (*ē-tŭr'bē*), JOSÉ, pianist, conductor, and composer, born in Valencia, Spain, Nov. 28, 1895. He studied in Valencia and Paris before touring Europe as a pianist. In 1928 he came to the U.S.

and made his debut with the Philadelphia Symphony. His career as a conductor began in Mexico City in 1933; his debut as a conductor in New York City was made at the Lewisohn Stadium Concerts. In 1936 he was appointed conductor of the Rochester Symphony. During his career, Iturbi has appeared with every major orchestra in North and South America and in Europe. He has played more concerts in the U.S. than any other pianist except, perhaps, Ignace Paderewski. He has also frequently conducted radio concerts and appeared in several motion pictures. Many composers, including Igor Stravinsky, have created music for him. He is less well known as a composer, but two of his works have met with success, "Fantasy for Piano and Orchestra" and "Soliloquy for Orchestra."

Iturbide (*ē-tōōr-bē'THā*), AGUSTÍN DE, revolutionist, emperor of Mexico, born in Valladolid (now Morelia), Mexico, Sept. 27, 1783; executed in Padilla, July 19, 1824. He was a member of the Mexican army which fought and defeated the Mexican revolution for independence from Spain. Iturbide continued to favor loyalty to Spain and was rewarded with the command of an army to keep down the insurgents. Later, probably due to promises of power, Iturbide joined the revolutionaries. In 1821 the independence of Mexico was recognized by the Spanish viceroy; and on July 21, 1822, Mexican independence was proclaimed, under a Spanish Bourbon prince. Conflicts arose, and as a result Iturbide was crowned Emperor Agustín I. His authoritarian rule met with opposition, and after ten months he was forced to abdicate. He went to Europe for a year and then made an attempt to recover the crown. He landed in Mexico on July 14, 1824, in disguise, was recognized, and was executed.

Ivan (*ī-vän'*), the Russian equivalent of John, by which name several Russian czars are known. IVAN I (died 1341), known also as Money Bag, was the grand duke of Moscow, 1328-40. He did much to consolidate the power of Moscow, from which later evolved Great Russia. His son, IVAN II (1326-59), was grand duke of Moscow from 1353 to 1359.

Ivan III, known as IVAN THE GREAT, grand duke of Moscow, born in 1440; died in 1505. During his reign (1462-1505), industry expanded and laws and Western civilization were introduced. In 1472 he married Sophia, niece of Constantine XI Palaeologus, last Byzantine emperor. Consequently, Byzantine court customs were adopted in Moscow. Ivan conquered the state of Novgorod and won control of part of Lithuania to gain access to the Baltic Sea. He established autocracy and a unified Muscovite power, freed from the Tartars. Because of his skill in diplomacy, law, and war, he became known as Ivan the Great.

Ivan IV, known as IVAN THE TERRIBLE, czar of Muscovy, born Aug. 25, 1530; died March 18, 1584. From 1533 to 1544 he ruled under the regency of his mother, Helena Glinska, and the boyars, a class of hereditary nobles. In 1547 he assumed the title of czar. Among his accomplishments were the suppression of the boyars, the annexation of Siberia, the introduction of local self-government and of printing, and the establishment of trade relations with England. After a grave illness and the death of his wife and one of his sons, he became increasingly despondent, tyrannical, and suspicious. Fearing a conspiracy against himself in Novgorod, he destroyed the city and massacred the population. In a fit of rage, he killed his eldest son, Ivan. His acts of violence, always followed by repentance and prayer, earned him the epithet of Ivan the Terrible. In spite of his cruelty, he is credited with political, social, and cultural advances.

Ivanovo (*ĭ-vä'nŭ-vŭ*), formerly IVANOVO VOZNESENSK, a city in the U.S.S.R., capital of the Ivanovo region of the Russian Soviet Federated Socialist Republic. Located about 160 m. N.E. of Moscow, it is an industrial center, devoted primarily to textile production. Population, 1956, 319,000.

Ivernia (*ī-vēr'nĭ-ą*). See *Hibernia.*

Ives (*īvz*), CHARLES EDWARD, composer, born in Danbury, Conn., Oct. 20, 1874; died in New York, N.Y., May 19, 1954. Much of his musical training came from his father, a bandmaster. He studied under Horatio Parker at Yale Univ., from which he was graduated in 1898, and later was an organist in various churches. From 1906 to 1930 he was active in his own insurance company. As an avocation, he composed symphonies, chamber music, chorales, and songs, in which he explored new patterns of harmony, unusual rhythms, and atonality. His work is distinctively American in its use of folk music and evocation of life in America. In 1947 Ives was awarded the Pulitzer Prize for his third symphony, composed in 1911 and first performed in 1946. Other works are "Piano Sonata" (1902), "Holidays" (1912-13), and "First Orchestral Set" (1914). See also *American Music and Music Life.*

Ives, HERBERT EUGENE, physicist, inventor, born in Philadelphia, Pa., July 31, 1882; died in Upper Montclair, N.J., Nov. 13, 1953; son of FREDERICK EUGENE IVES (1856-1939), an inventor of photoengraving and color-photography processes. The younger Ives was noted for his contributions to the development of television and to the commercial use of wire photos.

Ives, IRVING MCNEIL, Senator (R, N.Y.), born in Bainbridge, N.Y., Jan. 24, 1896; died in Norwich, Feb. 24, 1962. He attended Hamilton Coll. and served in the New York state assembly (1930-46), where he was majority leader after 1937 and

Courtesy Bettmann Archive, N.Y.

IVORY CARVING, MIDDLE OF THE 4th CENTURY

sponsored an antidiscrimination law. He then served in the U.S. Senate (1946-58) and was a member of the Republican party's liberal wing. Because of ill health he did not seek a third term. He campaigned (1954) for the New York governorship but lost to W. Averell Harriman (*q.v.*).

Ivory (*ī'vô-rĭ*), a term generally used to refer to the hard substance which constitutes the greater part of the tusk of the elephant, similar to dentine (*q.v.*). The narwhal, hippopotamus, and walrus are also considered ivory-bearing animals. The value of ivory lies in its resilience, hardness, whiteness, fine grain, and susceptibility to high polish. Elephant ivory from the eastern half of Africa is the most valuable because of its color, texture, and density. In addition to parts of Africa, ivory is obtained from Siberia and Alaska, where large fossil deposits of the extinct mammoth can be found. The tusks of elephants commonly weigh about 60 lb. each, but some have been recorded as weighing over 200 lb. Ivory is used in making ornaments, handles for knives and forks, expensive billiard balls and piano keys, and other luxury articles. Ivory is especially well suited for carving and has been used for that purpose universally, dating back to earliest prehistoric times. The ancient civilizations in the Middle East left ivory statuary, the Greek sculptors made use of ivory, and it is mentioned in the Bible in connection with Solomon. In India, China, and Japan, ivory carving has been a highly developed art since earliest times. *Ivory black* is a substance made by carbonizing ivory scraps and shavings and is used in inks and artists' paints.

Ivory Coast, a country in French West Africa. It has a coast line on the Atlantic Ocean in the south and is bounded on the N. by the Sudanese and Voltaic republics, on the E. by Ghana, and on the W. by Liberia and Guinea. Covering an area of 124,471 sq. m., it is divided into a coastal lowland and a heavily forested inland plateau. It has an equatorial climate. The population consists mostly of Negroes, forming many ethnic groups. Several thousand miles of roads and rivers (chiefly the Bandama and Sassandra), navigable for short distances, provide transportation. The chief exports are cocoa, coffee, bananas, and timber. Gold is mined, and there is some raising of livestock. Most trade passes through Abidjan (pop., 1960, 177,500), the capital. Chief ports besides Abidjan are Sassandra and Tabou.

In 1842 the French gained treaty rights to Ivory Coast territory, but active development did not begin until 1882. Formerly an overseas territory of France, the Republic of the Ivory Coast has been a member of the French Community since 1958 and became independent Aug. 7, 1960. Population, 1960 (est.), 3,230,000.

Ivory Palm, the common name given to a South American species of palm which yields ivory nuts or vegetable ivory. A native of the Andean region, the palm has a stubby stem about 2 ft. tall, but its leaves may be up to 20 ft. long. Staminate and pistillate flowers are produced on separate plants, the stamens appearing on long slender spikes. The pistillate, or fruit-producing, flowers are borne in dense, compact heads. Each pistil ripens to form a fruit like a flesh drupe, containing a hard, nutlike center. White and ivorylike in texture, these are much used for the production of small ornamental objects.

Ivory, VEGETABLE. See *Ivory Palm.*

Ivy (*ī'vĭ*), the common name applied to a number of different vines. In horticulture, the name is given particularly to one or a few species of the genus *Hedera* in the aralia family.

English or European ivy (*Hedera helix*) grows as a trailing or climbing plant, with leathery,

dark-green, evergreen leaves, with three to five lobes. The vine climbs by means of numerous adventitious (*i.e.*, aerial) roots, which cling to rough surfaces—such as the bark of trees or stone or brick walls—and the plant may reach many feet in length. In the U.S. this species is hardy only as far north as the latitude of New York City, where it is often used as ground cover on plots too shaded for lawns. Some 50 species are known in the genus *Hedera*, one of which, known as Algerian ivy, is extensively used in southern California to prevent erosion on the banks of express highways. Many variations of English ivy are cultivated as pot plants.

The Japanese or Boston ivy is a Japanese species (*Ampelopsis Veitschii*) of the grape family. Like English ivy, it has leaves with three to five lobes, but they are paler in color and not evergreen. The Boston ivy climbs by means of branching stem-tendrils which form clinging disks at their tips. This plant is the common wall-covering ivy of the northern states, and it is related to the native woodbine, or Virginia creeper. Some leaves of the Boston ivy may be divided into three separate leaflets and be mistaken for poison ivy.

See also *Poison Ivy; Poisonous Plants.*

Iwo Jima (*ē'wō jē'mą*), an island in the western Pacific, part of the Volcano island group, 660 m. s. of Tokyo. The island, *ca.* 8 sq. m. in area, was annexed by Japan in 1887. It became known in World War II as a heavily fortified Japanese base; a fierce contest for its possession (February-March 1945) was won by U.S. forces after about a month of fighting. A marble memorial marks the spot where U.S. Marines raised the flag on Mt. Suribachi on Feb. 23 (for illustration, see *Marine Corps*). The island was later placed under U.S. Navy administration.

Ixion (*ĭks-ī'ŏn*), in Greek mythology, a king of the Lapithae in Thessaly. Because he did not wish to pay the customary bride gifts, Ixion murdered his father-in-law. Zeus purified him of the crime, but Ixion repaid the god's mercy by attempting to seduce Hera. When Zeus substituted a phantom for her, by whom Ixion fathered the Centaurs, Ixion boasted of his supposed conquest. For his impiety Zeus condemned him to be bound to a wheel which revolved forever in the underworld (in some versions, the air). Ixion's wheel is, thus, in some myths, a symbol of eternal punishment.

Ixtacihuatl (*ĕs-tä-sē'wä-t'l*). See *Iztaccihuatl.*

Izalco (*ē-säl'kō*), a volcano in southwestern El Salvador, the most active in Central America. It is known as the lighthouse of the Pacific because its almost continuous smoke and flames serve as a beacon to mariners at sea. The volcano formed in 1770 and since then has been destructive at various times. Its height is variously given but is generally considered to be *ca.* 6,200 ft. At the foot of the volcano there is a small town of the same name.

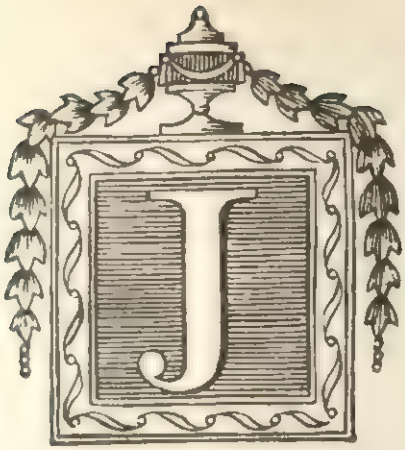
Izard (*ĭz'ĕrd*), RALPH, statesman, born near Charleston, S.C., Jan. 23, 1742; died there, May 30, 1804. While living in Paris, he was elected commissioner to Tuscany by the U.S. Congress in 1777. He was never received by that government and remained in France, where he did succeed in opening negotiations with Tuscany, aided in securing funds for warships, and assisted Arthur Lee (*q.v.*) in obtaining the treaty of alliance with France. Izard was involved in many controversies with Benjamin Franklin (*q.v.*) and was recalled by Congress in 1779. In 1782 Izard was chosen as a delegate to Congress from South Carolina, and he was a U.S. Senator from 1789 to 1795. He was the father of GEORGE IZARD (1776-1828), soldier and territorial governor of Arkansas (1825-28).

Izmir (*ĭz'mĭr*), Turkish name for Smyrna (*q.v.*).

Iztaccihuatl (*ĕs-täk-sē'wä-t'l*), or IXTACIHUATL, an extinct volcano in Mexico, situated near Popocatepetl (*q.v.*), 20 m. S.E. of Mexico City. Its name means white woman in Aztec. The volcano has three summits, the highest of which reaches *ca.* 17,000 ft., and no crater.

Izvolsky (*ĕs-vŏls'kĭ*), ALEKSANDR PETROVICH, diplomat, born in Moscow, Russia, March 17, 1856; died in Paris, France, Aug. 16, 1919. After being graduated with highest honors from the Imperial Lyceum of St. Petersburg (Leningrad), he began his career as a diplomat. Among the government posts he held were minister of foreign affairs (1906-10) and Russian ambassador to France (1910-17), in which positions he aligned his country with England and France. His forcefulness made him virtual head of Russian foreign policy until the Revolution in 1917.

Izúcar de Matamoros (*ē-sōō'kär THä mätä-mō'rōs*), or MATAMOROS, a town in Mexico, in the state of Puebla, *ca.* 70 m. S.E. of Mexico City, in a sugar district near the volcano Popocatepetl. The town was named in honor of Mariano Matamoros (*q.v.*). Population, *ca.* 7,500.



J (*jā*), the seventh consonant and 10th letter of the English alphabet. It is classed as a palatal, its sound being that of *g* in *gem*, or of *dg* in *ridge*. Formerly it was interchangeable with *i*, the same character being used for both, and the separation of the two letters in English lexicons is comparatively recent. The sound does not occur in the Anglo-Saxon and was introduced from the French. It is used as a symbol in medical prescriptions at the end of a series of numbers, as vij=seven, viij=eight.

Jabiru (*jăb'ĭ-rōō*), the name of several birds of the stork family, native to Africa, Australia, and the tropical parts of South America. An American species is sometimes seen as far north as Florida. The body is about 4 ft. long, with a wing extension of 7 ft., and the plumage is white. The head and neck are black with reddish markings and are destitute of feathers. It is the only true American stork.

Jabotinsky (*zhä-bō-tĭns'kĭ*), VLADIMIR EVGENEVICH, British Zionist leader, born in 1880; died in 1940. During World War I, he founded the Jewish Legion in Palestine. In 1923 he organized the World Union of Zionist-Revisionists, of which movement he was president until his death. In 1935 he also became president of the new Zionist Organization.

Jacana (*jăk'ä-nä*), the name of several species of small wading birds native to the warmer parts of the continents. They are related to the plovers, but quite closely resemble the rails. The toes and claws are remarkably long and slender, enabling them to walk on the floating leaves of water lilies and other aquatic plants while in search of food. The common jacana of South America is about 10 in. long, has a black color marked with bright chestnut, and is abundant in Brazil and Guiana. The purple jacana is met with in Mexico and Texas and is peculiar in having a strong spur at the bend of each wing, which it uses in fighting its enemies. Several species are native to Australia and Africa, including the so-called lotus bird, named from its habit of frequenting places where the lotus grows.

J'Accuse (*j'āk-ūz'*), French, meaning "I accuse," a famous quotation from Emile Zola (*q.v.*). With these words, the French novelist began his famous article demanding (1898) the reopening of the case against Capt. Alfred Dreyfus (*q.v.*).

Jack (*jăk*), a mechanical or hydraulic apparatus for lifting heavy weights. The simplest form is the screw jack, which serves to apply much lifting power, while with a hydraulic jack a single man is able to raise 10 tons one ft. in a minute and a half. Jack is a nickname for John. It is the name of a flag used in the navy of the U.S. and Great Britain, which is displayed nearest the staff or on the end of the bowsprit. Jack is likewise the name of a species of the breadfruit tree found in the South Sea islands, which bears a large fruit, often weighing 30 lbs. The fruit is eaten extensively by the natives.

Jackal (*jăk'ăl*), an animal similar to the dog, native to many parts of Asia and Africa. It somewhat resembles the fox and wolf, but is smaller than any of the wolves. The pupil of the eye is circular, as in the dog and wolf, but the tail is more nearly like that of the fox. Jackals live in holes in the ground, have a dirty color, and eat any kind of flesh. They come out of their places of hiding to search for food during the night, often in large packs, running down the animals on which they feed. In some countries they skulk around the camps of armies, where they devour

Courtesy American Museum of Natural History, N. Y.

JACKAL

refuse matter or dig up hastily buried dead. The jackal is easily domesticated and interbreeds with the dog.

Jack and the Beanstalk (*jăk ănd thē bēn stąk*), a popular nursery tale about the adventures of a boy who climbs a magic beanstalk and finds an ogre's castle. While the story is based on a myth known in many lands, the version U.S. readers are familiar with is taken from an old English folk tale. The opera "Jack and the Beanstalk" (1930) was composed by Louis Gruenberg (1884-). See color plate in Volume I.

Jackdaw (*jăk'dą*), a common bird of the crow family, belonging to the genus *Corvus*. It is smaller than the rook, has white eyes, a short bill, a gray neck, and glossy black back and wings. The jackdaw, native to all continents, is most common in Europe. It frequents towns and cities, often building its nest in chimneys and spires. The female lays four to six blue eggs, covered with brown spots. Jackdaws feed on larvae, insects, and worms.

Jack-in-the-Pulpit (*jăk-ĭn-thē-pōōl'pĭt*), or INDIAN TURNIP, a flowering plant common in moist and shady woods. It is a perennial herb, has a turnip-shaped root, and usually bears two leaves made up of three leaflets. The root is acrid, or biting, and is used to some extent in medicine. It has small flowers grouped together and surrounded by a greenish leaf, which falls away and the red berries become exposed. About the middle of the summer all parts wither, except the stem and the berries. This plant thrives in gardens when planted in a cool and moist place.

Jack Rabbit (*jăk răb'ĭt*), the name of a large rabbit which is found on the plains of North America, but is seldom seen east of the Mississippi River. It has large ears and is noted for its long leaps and great speed. Though gray in summer, it becomes white in winter. The jack rabbit is sometimes confused with the Norwegian hare, which has been introduced into the U.S.

Jackson (*jăk'sŭn*), a city in southern Michigan, seat of Jackson County, on the Grand River, 35 m. s. of Lansing. It is on the Grand Trunk Line (freight), the N.Y. Central, and the Michigan Central R.R.'s. The manufactures of the city include transportation equipment, nonelectrical machinery, fabricated metals, and rubber tires. It dominates the Jackson, Mich., standard metropolitan statistical area (22.1 sq. m.; pop., 1960, 131,994), which comprises Jackson County. The area had a value added by manufacture (1958) of $150,359,000; the city's value added by manufacture was $119,817,000. The vicinity was settled in 1829 and the city was incorporated in 1857.

Population, 1940, 49,656; in 1950, 51,088, in 1960, 50,720.

Jackson, a city in southwest central Mississippi, capital of the state and seat of Hinds County, on the Pearl River, 180 m. N. of New Orleans, La. It is on the Illinois Central and the Gulf, Mobile and Ohio R.R.'s. Among the highly diversified manufactures of the city are furniture, machinery, fluorescent lamps, aircraft parts, and cork tile. Jackson is at the center of the Jackson standard metropolitan statistical area (877 sq. m.; pop., 1960, 187,045), which comprises Hinds County. The area had a value added by manufacture (1958) of $70,606,000; the city's value added by manufacture was $64,077,000. Jackson is the seat of four colleges: Belhaven, Millsaps, Jackson State, and J. P. Campbell. In 1821 Jackson, then known as Le Fleur's Bluff, was chosen as the state capital; it was incorporated as a city in 1840. Union forces under Gen. U. S. Grant occupied the city in 1863, and the next year it was partly destroyed by Gen. William T. Sherman. Population, 1950, 98,271; in 1960, 144,422.

Jackson, a city in western Tennessee, seat of Madison County, 85 m. N.E. of Memphis. It is on the Gulf, Mobile and Ohio, the Illinois Central, and the Louisville & Nashville R.R.'s. Manufactures of the city include flour, cottonseed oil, utensils, drugs, wearing apparel, lumber, and concrete products. Jackson had a value added by manufacture (1958) of $14,082,000. Lambuth Coll., Union Univ., and Lane Coll. are located in the city. Jackson was settled in 1810 and incorporated as a city in 1845. Population, 1950, 30,207; in 1960, 34,376.

Jackson, ANDREW, seventh President of the U.S., born in Waxhaw, S.C., March 15, 1767; died near Nashville, Tenn., June 8, 1845. His father, Andrew Jackson, was an Irish emigrant who came to America in 1765 and died in 1767. His mother, Elizabeth Hutchinson, supervised his early training. His formal education was limited. In 1781 he took up arms against the British, was taken prisoner, and afterward received a wound

from an officer whose boots he refused to clean. Though intended for the ministry by his mother, he entered upon the study of law at Salisbury, N.C., in 1785, and three years later went to Nashville, Tenn., where he took up the practice of law. In 1796 he served as a member of the convention which formulated the constitution of Tennessee, and in the same year was elected to Congress, the state then being entitled to only one representative. He supported Thomas Jefferson for the Presidency in 1796, became a U.S. senator in 1797, but resigned his seat the following year to become a judge of the State of Tennessee, in which capacity he served until 1804.

Jackson took part in the Tennessee Indian wars, showing marked courage, and was appointed major general of militia. When war was declared against Great Britain in 1812, he offered his service and those of 2,500 volunteers. Soon after, he led a body of 2,070 men in the direction of New Orleans, but in February 1813 received an order at Natchez by which his troops were dismissed from further service. In October of the same year he commanded a force against the Creek Indians, whom he defeated at Talladega in November. The victory at Horseshoe Bend destroyed the Creek power, while his vigorous service gave him marked popularity and led to his appointment as major general in the regular army. In 1814 he was ordered to the Gulf of Mexico to resist an expected British invasion, where he seized Pensacola, then used as a base for British operations. In December he moved his army to New Orleans, where he gained several victories over the British in two engagements, and subsequently defeated them in a decisive battle on Jan. 8, 1815, in which he repulsed 12,000 British veterans with a loss of 2,600, while the Americans lost only 13 wounded and six killed. The battle was the last of the war, and was fought 15 days after the treaty of peace had been signed at Ghent, information of which had not reached Gen. Jackson. He commanded in the war against the Seminoles of Florida in 1817-18, seized Pensacola, and executed Ambrister and Arbuthnot, two Englishmen who were accused of inciting the savages to hostile acts against the Americans. In 1821 he was appointed governor of Florida and two years later became U.S. senator from Tennessee.

The legislature of Tennessee proposed Gen. Jackson as a candidate for the Presidency in 1824. His three competitors were Henry Clay, William H. Crawford, and J.Q. Adams, but the election resulted without a choice, since none of the candidates received a majority. The electoral college gave Jackson 99 votes, Adams received 84 votes, Crawford received 41 votes, and Clay received 37 votes. No candidate having received a majority, the election devolved upon the lower house of

Courtesy National Gallery of Art, Wash., D. C.

ANDREW JACKSON

Painting by Ralph E. W. Earl (died 1837)

Congress. However, in the House of Representatives the result was favorable to Adams. In 1828 the Democrats succeeded in electing Gen. Jackson to the Presidency with 178 electoral votes, while Adams received 83, and he was re-elected four years later. His policy in the civil service was to show a preference to the members of his own party, which was expressed by Senator Marcy, of New York, in this wise: "To the victor belong the spoils." His prompt and decisive action in the question of nullification was an example of eminent statesmanship. The culminating event in this respect was brought about in 1832 by a protective tariff bill distasteful to South Carolina, which caused that state to pass a nullification act in which the law was declared inoperative and unconstitutional within its borders. Jackson acted promptly by issuing a proclamation in which he declared that the law would be enforced, and that state accordingly submitted. The veto of the bill rechartering the U.S. Bank was another important act of his administration, which undoubtedly was in the interest of the American financial policy.

Jackson was a man of action rather than a thinker. He was decisive and unalterable in his position. As a whole he is one of the most commanding personalities in American history. Many of his decisions were determined by an organization of his friends known as the *Kitchen Cabinet.* He retired to private life at the expiration of his term and resided at the Hermitage, near Nash-

ville, where he died. He is buried there.

Jackson, HELEN FISKE HUNT, author, daughter of Nathan W. Fiske, born in Amherst, Mass., Oct. 18, 1831; died in San Francisco, Cal., Aug. 12, 1885. She was educated at Ipswich Female Sem., Ipswich, Mass., and in 1852 married Maj. E.B. Hunt, who died in 1863. She married William S. Jackson, of Colorado Springs, Col., in 1875, and four years later became interested in the treatment of the Indians by the U.S. Government. In 1883 she was appointed special commissioner to inquire into the condition of the Mission Indians in California. Her first literary productions appeared over the signature of H.H., and by 1870 she attained popularity as a writer. Among her best-known writings are: "A Century of Dishonor," "Verses by H.H.," "Ramona," and "Glimpses of Three Coasts."

Jackson, ROBERT HOUGHWOUT, jurist, born at Spring Creek, Pa., 1892; died in Washington, D.C., Oct. 9, 1954. After graduating from Albany Law School, he practiced law at Jamestown, N.Y. He became nationally prominent in 1934, when he was appointed counsel for the Federal Bureau of Internal Revenue. Two years later he became an assistant U.S. attorney general, solicitor general in 1938, and Attorney General in 1940. In 1941 he was made an associate justice of the U.S. Supreme Court. In 1945 he was appointed chief U.S. prosecutor of the International Military Tribunal at the Nuremberg trials (*q.v.*).

Jackson, SAMUEL MACAULEY, educator and author, born in New York City, June 19, 1851; died Aug. 2, 1912. In 1870 he was graduated from the Coll. of the City of New York, and afterward studied at the Union Theological Sem. and the Univ. of Leipzig. He was pastor of a Presbyterian church at Norwood, N.J., in 1876-80, and was made professor of church history in New York Univ. in 1895. Besides publishing many useful books, he edited the "Encyclopaedia of Religious Knowledge." He was connected editorially with the "Standard Dictionary," "Cyclopaedia of Living Divines," "Johnson's Universal Cyclopaedia," and "Webster's International Dictionary." He was editor of the department of religion in the "New International Encyclopaedia."

Jackson, THOMAS JONATHAN, general, known as "Stonewall Jackson," born in Clarksburg, W.Va., Jan. 21, 1824; died May 10, 1863. When he was but three years old, his father died and left the mother to support three children by teaching school and sewing. In 1842 he was appointed a student at West Point, four years later received a commission as second lieutenant, and shortly after entered the service in the Mexican War. He resigned his commission in 1851 and became professor of military tactics and mathematics in the Virginia Military Inst. at Lexington, Va.

At the beginning of the Civil War, in 1861, he entered the Confederate army with the rank of brigadier general and was made major general at the end of the year. His promotion was based upon his eminent service in the Battle of Bull Run, where he received the name "Stonewall" from an expression made by Gen. Bee to encourage his soldiers, when he pointed toward Jackson and exclaimed: "There is Jackson standing like a stone wall; rally behind the Virginians." His military fame was still more firmly grounded by well-directed movements in the Shenandoah campaign in 1862, when he displayed much greater skill than Banks, Frémont, and McDowell, gaining the battles of Winchester, Cross Keys, and Ft. Republic. He decided the victory at Gaines's Mill, June 27, 1862, by hastily joining Lee before Richmond. On Aug. 9 the Federals were defeated by him at Cedar Mountain and afterward in the second battle of Bull Run.

THOMAS J. JACKSON

He captured Harper's Ferry in September, when he took 70 cannon and 13,000 prisoners, shortly joining Lee by a forced night's march, and gave valuable aid to the Confederate cause at Antietam. He commanded the right wing of Lee's army at Fredericksburg in December and at Chancellorsville on May 2, 1863, where success was assured by his skillful flanking movement around Hooker's right. While making a reconnaissance after the Battle of Chancellorsville, he was inadvertently fired upon by his own men and received three wounds. His left arm was amputated and he would undoubtedly have recovered, but a severe attack of pneumonia set in, from which he died. Stonewall Jackson was a man of much energy, deep moral feeling, and natural bravery. He never went into a battle without a prayer and always thanked God after victory. His loss to the Confederate cause was greater than that witnessed in the fall of any other man, and was never replaced.

Courtesy Tourist and Convention Bureau, Jacksonville, Fla.

VIEW OF JACKSONVILLE, FLA.

Jacksonville (*jăk'sŭn-vĭl*), county seat of Duval County, Florida, on the St. Johns River. It is 18 m. up-river, and a 34-ft. channel connects it with the Atlantic Ocean. The city covers an area of 39.35 sq. m., including a water area of 9.15 sq. m. As a seaport, it is served by a number of steamship lines, and five lines, including the Seaboard Air Line and the Atlantic Coastline, provide railroad transportation. Three airports serve the area, Imeson Airport being about 7 m. from the downtown section. The city has well-known beaches and recreation facilities, including parks, swimming pools and the Gator Bowl. Among the landmarks are the 22-story Prudential Insurance Co. building, Florida's tallest office building; the Federal Building; the Independent and the Gulf life insurance company buildings; and the City Hall, scheduled for completion in 1960.

The chief industries located in Jacksonville are cigars, paper, naval stores, lumber, boat-building, chemical products and fertilizers, but the recent growth of banking and insurance interests has earned it the distinction of being "the financial capital of the Southeast."

The educational and cultural pattern is marked by the county school system, with an annual enrollment of about 85,000 pupils, Jacksonville Univ., Jacksonville Coll. of Music, and Edward Waters Coll. There are a public-library system, an art museum, a children's museum, a symphony association, and a civic music association, among other community cultural organizations.

The government operates under an 1887 charter (basic) and is composed of a five-member city commission, including a mayor-commissioner, and a nine-member city council; all elected officials serve four-year terms.

Jacksonville was the site (1784-1817) of a Spanish fort (San Nicholas). It was settled in 1816 and named Cowford, receiving its present name, in honor of Andrew Jackson (*q.v.*), in 1822; ten years later it was incorporated as a city. Both armies saw action nearby during the Civil War, and the section suffered during Reconstruction until the 1870's.

The city's economic growth is due to climate and the river and its location for trade. A recently announced $30,000,000 development program provides for a new city hall, a sports coliseum, a municipal auditorium, and other improvements. The Mayport carrier base and other Navy installations are in the vicinity.

The population increased from 28,420 in 1900 to 204,517 in 1950 and an estimated 231,300 in 1959, but the largest increase, 43,516, occurred between 1930 and 1940.

Jacksonville, county seat of Morgan County, Illinois, 34 m. w. of Springfield. It is on the Gulf, Mobile & Ohio and other railroads. It is the seat of MacMurray Coll., Illinois Coll., the Illinois state schools for the deaf and blind, and Jacksonville State Hospital. Other noteworthy features are Duncan Park, a 19th-century Georgian house, the site of the William Jennings Bryan home, and the Morgan County fair grounds. The principal manufactured products are galvanized and enamel ware, men's clothing, fabricated metal buildings, refrigerators, and meat, poultry, and dairy products. The city was laid out in 1825 and incorporated in 1867. Population, 1930, 17,747; in 1950, 20,387.

Jacob (*jā'kŭb*), the third of the Hebrew patriarchs, the son of Isaac and Rebekah, twin brother of Esau, and grandson of Abraham. He was a favorite of his mother and by her suggestion obtained the birthright of his brother Esau. Subsequently, to escape Esau's vengeance, he fled to his uncle, Laban. In 21 years he returned to Canaan with his two wives, Rachel and Leah, two concubines, and 12 sons. One of his sons, Joseph, who was a favorite of the father, was sold by his brothers and taken to Egypt. At the time of the famine in Canaan he went with his family to Egypt, where he died.

Jacobi (*yä-kō'bē*), ABRAHAM, physician, born in Hartum, Germany, May 6, 1830; died July 11, 1919. He studied at Greifswald, Göttingen, and Bonn, being graduated from the last mentioned in 1851. Two years later he settled in the U.S., established himself in New York, and in 1857 was one of the founders of the German dispensary. In 1860 he was made professor of diseases of children in the New York Medical Coll., and held a similar chair in the Univ. of the City of New York, serving until 1870, when he became clinical professor in the medical department of Columbia Univ. He resigned the latter position in 1902, after serving efficiently for 22 years. Through his influence pediatrics (*q.v.*) became reorganized as a distinct branch of medicine.

Jacobi, MARY PUTNAM, physician, born in London, England, Aug. 31, 1842; died June 10, 1906. Her father resided in New York. She pursued the study of medicine in Philadelphia, New York, and Paris, and was the first woman admitted to the École de Médicine. She married Dr. Abraham Jacobi (*q.v.*) in 1873, was a dispensary physician in Mt. Sinai Hospital for 12 years, and served as professor of materia medica in Woman's Medical Coll., New York.

Jacobins (*jăk'ō-bĭnz*), the most celebrated political club maintained during the French Revolution. It was organized at Versailles in 1789, when it was called the Club Breton. When the national assembly was removed to Paris, it increased rapidly in numbers and importance. Gradually it grew to greater controlling power than the national assembly, and by the year 1791 had 1,200 subordinate societies. Its height of power was reached in 1792, when it was foremost in the insurrectionary movements. The Commune of Paris was originated by the Jacobins, and through Robespierre they ruled supreme until his overthrow in 1794. After the execution of Robespierre, the club was prohibited by law and its halls were closed. Extreme revolutionists and those holding radical views in politics are often designated Jacobins.

Jacobites (*jăk'ō-bīts*), the name of a Christian sect of Western Asia, confined chiefly to Syria and Mesopotamia. They were so named from Jacobus Barbadaeus, Bishop of Edessa, who united them into a distinct religious sect. They are Monophysites in belief; that is, they maintain that the divine and human natures in Christ were so united as to form only one nature. The patriarch of Antioch is the head of the present Jacobites, and his appointment is subject to confirmation by the Sultan of Turkey. Three bishops and eight metropolitans are under the patriarch, who has his seat at the monastery of Zaphran, near Mardin. The Copts of Egypt originated from the Jacobites and like them hold to the doctrine of the single nature of Christ. They use the Syriac language in their church service, practice circumcision before baptism, and in most other respects resemble the orthodox Greek Church.

Jacobites, a party in Great Britain which adhered to the male line of the house of Stuart after the revolution of 1688. They were numerous and powerful in Scotland, and for more than half a century continued to advocate the restoration of the dethroned James II and his descendants. They rose in revolt in 1715 and in 1745, but the party became extinct after the death of the Pretender, Charles Edward, in 1788. In Ireland the Jacobites were supported by the Celts against the Saxons and by the Roman Catholics against the Protestants.

Jacob's Ladder (*jā'kŭbz lăd'ēr*), a hardy, perennial herb belonging to the genus *Polemonium*. It owes its name to the regular manner in which the leaflets are arranged on the long leaves. The plant rises to a height of one to three feet and has large blue or white bell-shaped flowers.

Jacquard (*zhä-kär'*), JOSEPH MARIE, inventor, born in Lyons, France, July 7, 1753; died Aug. 7, 1834. He was descended from humble parents, who were weavers, became interested in mechanical construction at an early age, and fell heir to two looms and a small estate at the death of his father. Having little ambition to do manual work, he spent much time in devising improvements in machinery for weaving, but, owing to ill success at first, he became a lime burner, while his wife engaged in plaiting straw. At leisure times he labored at his machines, and in 1801 secured a medal for an invention exhibited at the industrial exhibition in Paris. This invention made it possible to weave fine figured silks much more rapidly than had been possible previously. Napoleon summoned Jacquard to Paris and for useful service awarded him a liberal pension. The manufacture and use of weaving looms were opposed by many of the laborers, although the great value of his machine for producing the finer silk fabrics brought it forward and revolutionized the industry. It came into almost universal use before the death of the inventor. He was given several pensions and was granted the cross of the Legion of Honor. In 1840 a fine statue was erected to his memory in Lyons.

Jacquerie (*zhăk-rē'*), INSURRECTION OF THE, the name of a war conducted by the peasants against the nobles of France. It began in 1358, at the time John II of France was a prisoner in England. The insurrection was caused by the tyranny of the nobles and had its beginning near Paris, whence it extended rapidly to the valley of the Marne and elsewhere. At first the peasants were successful and committed many atrocities, but they were defeated near Meaux by Charles the Bad of Navarre. The nobles retaliated by killing

many peasants and burning their villages. The name *Jacquerie* is derived from *Jacques Bonhomme*, a name frequently applied to French peasants.

Jade (*jād*), the name of a species of hornblende. It is composed chiefly of silica, calcium, magnesium, and alumina, and is valued for its hardness and toughness. The primitive peoples used it for making ornaments and utensils, and it is still employed as material for carved objects by the Chinese. Jadeite implements are found among the prehistoric ruins of Mexico, Peru, France, Spain, and Central America. Axes and adzes made of jade are seen frequently in museums, such as the famous adze found at Oaxaca, Mexico, which is now in the American Museum of Natural History in New York City.

Jadwin (*jăd'wĭn*), EDGAR, military engineer, born in Honesdale, Pa., in 1865; died in 1931. He studied at Lafayette Coll. and the U.S. Military Acad., from which he was graduated in 1890, and subsequently was assistant in government engineering. In 1898 he was in the volunteer service of the Spanish-American War, commanding part of the time at Matanzas, Cuba, where he also conducted military and sanitary surveys. After the war he was made a captain of engineers in the U.S. Army, and in 1902 was placed in charge of the river and harbor and fortification works on the Pacific coast, where he constructed the San Pedro breakwater. He published a number of reports and pamphlets, and wrote articles on military engineering.

Jaffa (*yä'fä*), or JOPPA, a city in Palestine, 33 m. N.W. of Jerusalem, now a seaport of Israel. It was the ancient port of Jerusalem, and the cedars of Lebanon were floated to the city from Tyre for the building of the temple. The Jewish opposition to the conversion to Christianity of the Gentiles was abandoned after a vision seen by Peter at Jaffa (then called Joppa, Acts 11: 1-18). The city reached its highest prosperity in the time of the Crusades, as a principal entry port for the Crusaders. It was destroyed, however, late in this period, rising in importance again in the 17th century. After the establishment of Israel in 1948, Jaffa became an Israeli port to which Arabs were to have access. In 1949 the port was combined with Tel Aviv to form the municipality of Jaffa-Tel Aviv. It exports livestock, cereals, fruits, and various manufactures. Population, 1944, 94,310.

Jagannath (*jŭg-ŭ-nät'*), or JUGGERNAUT, meaning "Lord of the World," the name applied to the Indian god Krishna. The term likewise has reference to the eighth incarnation of Vishnu and to numerous images of this deity, the most celebrated being at Puri, a city near the Bay of Bengal. The first mention of this god occurred in 318 B.C., and numerous temples and statues were erected to him at various times since. The image is wooden and has a black face, red body, and gilt arms. The mouth is usually extended and the eyes are formed of brilliant stones. It is worshiped on festal occasions by assemblages of pilgrims who give offerings in money. Formerly they dedicated themselves in sacrifice by throwing themselves on the ground for the purpose of having the car on which the idol is mounted pass over their bodies. The deluded and confiding worshipers thought that this form of death was instrumental in conveying them into heaven. Since European occupation the practice has gone gradually into disuse, deaths occurring at the festivals now being accidental rather than designed.

Jaguar (*jä-gwär'*), the American tiger, the largest representative of the cat family in America. It abounds chiefly in South America, though it is found in the region south of a line drawn due west from the boundary between North and South Carolina. It has a soft, rich fur, usually yellow, with large black spots, and within them are rings with smaller black spots. In strength it is little inferior to the tiger, being nearly 3 ft. high. The limbs are large, the body is thick, and the tail is long and of nearly equal thickness throughout. The jaguar is the largest carnivorous animal native to America. Its favorite abode is in the timber, where it lives chiefly on birds, monkeys peccaries, and other animals. It can readily climb trees and often springs upon its prey. The hide of the jaguar is valuable for footwear and gloves.

Courtesy American Museum of Natural History, N. Y.

JAGUAR

Jahn (*yän*), FRIEDRICH LUDWIG, soldier and educator, born in Lanz, Germany, Aug. 11, 1778; died in Freiburg, Oct. 15, 1852. He studied at Halle, Göttingen, and Jena, but enlisted in the Prussian army in 1805. In 1809 he became a teacher of gymnastics, and made that branch of study a popular, attractive science. In 1814, he secured a command in the volunteer corps, but, in 1818, was imprisoned by the government for teaching too large a measure of liberality in political affairs. He was elected to the national assem-

bly in 1848 and wrote numerous works on political and social questions. The influence of his teaching of gymnastics led to the formation of *Turnverein,* many of which are still maintained in German communities.

Jail Fever (*jāl fēv'ēr*). See *Typhus.*

Jaipur (*jī'pōōr*), or JEYPORE, a city in India, capital of the state of Rajasthan and formerly capital of the now nonexistent state of Jaipur. A walled city with broad, regularly laid-out streets, situated *ca.* 145 m. S.W. of New Delhi, it is a major commercial, banking, rail, and highway center with numerous industries. It is famous for handicraft products, such as jewelry, textiles, and enamel work. Notable among its buildings (many of which have been painted bright pink) are the maharaja's palace, the school of art, the observatory, and the Univ. of Rajasthan (opened in 1947). The city was founded in 1728. Population, 1961, 402,760.

Jalandhar (*jä'lŭn-dŭr*). See *Jullundur.*

Jalap (*jăl'ăp*), the common name of a plant and the drug obtained from it, named after the Mexican area Jalapa, where the plant is native. The plant, *Ipomoea purga,* belongs to the morning glory family and grows as a vine from a fleshy root. Extracts from the root are dried to form a commercial product which yields a laxative drug. The plant has been introduced into cultivation in India. The active compound jalapin, found in jalap, was once derived from scammony (*q.v.*).

JALAP

Jalapa (*hä-lä'pä*), full name JALAPA ENRIQUEZ, or XALAPA, a city in Mexico, capital of the state of Veracruz, *ca.* 54 m. N.W. of the city of Veracruz. Situated on the slopes of the Sierra Madre Oriental, it lies in a prosperous coffee-raising region; other products include sugar and tobacco. Because of its excellent climate, it is known as a health resort. Outstanding among the buildings is a Franciscan convent. Jalapa was founded early in the Spanish conquest of Mexico. Population, 1960, 66,269.

Jamaica (*jə-mā'kə*), an island in the Caribbean Sea, an independent member of the (British) Commonwealth of Nations, situated 90 m. S. of Cuba and 100 m. W. of Haiti. Its greatest east-west length is 145 m., its greatest width, *ca.* 45 m.; total area (with Pedro Cays and Morant Cays, both uninhabited), 4,411 sq. m. Attached to Jamaica as dependencies are the Turks and Caicos Islands, *ca.* 166 sq. m., situated 450 m. N.E. of Jamaica; and the Cayman Islands, *ca.* 100 sq. m., 200 m. N.W. of Jamaica.

Mountainous Jamaica has many high peaks, of which the tallest is Blue Mt. Peak (7,402 ft.). There are many small unnavigable rivers. The climate is mild and sunny but humid, coolest in the higher regions and on the northern coast. There are two wet seasons and two dry periods, and rainfall averages 77 in. annually.

Manufacturing is expanding rapidly; products include cement, textiles, clothing, shoes, tobacco and food products, matches, metal windows, wire, nails, paper, plastics, and phonograph records. The construction industry, both industrial and residential, has also undergone a tremendous post-war expansion. Agriculture produces sugar, bananas, coffee, cocoa, rum, and pimento. New prosperity began for Jamaica in 1952 when it first exported bauxite, of which it has the world's largest known deposits; it is now the leading exporter of this mineral. Gypsum and phosphates are also mined. Tourism brings considerable income; more than 225,000 persons visited the island in 1961. Kingston, the capital (pop., 1960, 123,213), on the southeast coast, is the leading cargo and passenger port.

Cities besides Kingston include Spanish Town, second-largest city and the capital until 1870; Montego Bay, an outstanding Caribbean resort; and Ocho Rios, Port Antonio, and Mandeville, all resorts. The University Coll. of the West Indies was opened at Mona, in St. Andrew, a Kingston suburb, in 1948.

Negroes represent over three-quarters of the population; persons of mixed blood, more than 18 per cent; and others include whites, East Indians, and Chinese. Economic pressures during the 1950's caused many thousands of Jamaicans to emigrate to England—39,200 in 1961—until free entry to Great Britain was halted on July 1, 1962.

Columbus discovered Jamaica in 1494, and Spanish settlement began in 1509. Taken by the British in the name of Cromwell in 1655, the island went officially to Great Britain under the treaty of Madrid (1670). Abolition of slavery (1833), leaving the sugar plantations without labor, and growing competition on the part of other sugar-producing areas brought a decline in prosperity.

After 1944 Jamaica gained an increasing degree of self-rule; on Nov. 11, 1957, it became the first British Caribbean colony to attain home rule in all spheres but foreign affairs and defense. In 1956 the island was a founding member of the British Caribbean Federation, which in 1958 was set up as the government of The West Indies (see *West Indies, The*). The Jamaicans voted in 1961 to leave the federation, however, and the island became independent on Aug. 6, 1962. It is now a dominion within the Commonwealth, with an elected legislature and a prime minister.

Population, 1943, 1,237,063; in 1960, 1,613,148.

Jamaica, county seat of Queens County, on Long Island, New York, 12 m. E. of Brooklyn. In 1898 it was included in the Borough of Queens of Greater New York, and has direct connections to Brooklyn and Manhattan by railway and subway lines.

James (*jāmz*), a river formed in Alleghany County, Virginia, by the union of the Cowpasture and Jackson Rivers. The length is 450 m., the course is largely toward the southeast, and it is navigable for large steamers to its confluence with the Appomattox, at City Point. Its largest northern tributary is the Chickahominy. The 60 m. nearest its mouth constitute an important estuary which articulates with Chesapeake Bay, while the James River and Kanawha Canal extends from Richmond to White Sulphur Springs. At Richmond it is obstructed for navigation by rapids which fall 100 ft. in 6 m. Lynchburg and Richmond are the most important cities on its banks, while Jamestown, the site of the first English settlement in America, is 32 m. from its mouth.

James, or DAKOTA, a river of the Northwestern states, rises in the east central part of North Dakota, flows south through South Dakota, and joins the Missouri about 8 m. below Yankton. The James flows through a fertile prairie country and is about 400 m. long. It is popularly called the Jim River.

James, SAINT, THE GREATER, son of the fisherman Zebedee, brother of John the Evangelist, classed as one of the three greatest of the 12 apostles. Jesus called him and his younger brother, John, to forsake their work of fishing and become fishers of men. He and his brother witnessed the transfiguration, the agony in the garden of Gethsemane, the restoration to life of the daughter of Jairus, and the ascension. In 44 A.D. he suffered martyrdom under Herod Agrippa. He is the patron saint of Spain, and is credited with carrying the gospel to the Iberian Peninsula.

James, SAINT, THE LESS, the eldest brother or a cousin of Jesus, called The Just in the Scriptures, a witness of Christ after His resurrection. He wrote the epistle that bears his name, was the first Bishop of Jerusalem, and spoke against those wishing to make the law of Moses binding upon Christians by a decision of the first apostolic council. He suffered death in 62 A.D. under the high priest Ananias, his death being decreed because of the rapid progress of Christianity under his preaching.

James, EPISTLE OF, in the New Testament, one of the so-called Catholic epistles, consisting mainly of ethical advice and moral exhortations. It is said to have been written by James the Less and addressed to Jews outside of Palestine.

James I, King of England and VI of Scotland, son of Mary, Queen of Scots, born in Edinburgh, Scotland, June 19, 1566; died Mar. 27, 1625. After the dethronement of his mother, he was proclaimed King of Scotland, June 29, 1567. His early training was under the guardianship of the Earl of Mar, while his later education was secured under the direction of George Buchanan. He succeeded to the throne of England after the death of Elizabeth, in 1603, but soon became unpopular with his English subjects. The famous Gunpowder Plot was brought about by his undue severities against the Roman Catholics, and many other evidences that he was unpopular were manifested against him. Though a well-read scholar, he was nervous, delighted in disputes, and showed distinct marks of weakness in judgment. The most noted event of his reign was the authorized translation of the Bible into the English, known as the *King James Version.* It was made under his patronage and at his direction.

James II, King of England, VII of Scotland, son of Charles I, born Oct. 15, 1633; died in St.-Germain, France, Sept. 6, 1701. He was created Duke of York in 1643, escaped to France during the Civil War of 1648, entered the army of Louis XIV, and later enlisted in the service of Spain. He married Anne, daughter of Lord Chancellor Hyde, in 1660, avowed his conversion to Catholicism in 1671, and became king after the death of Charles II, on Feb. 6, 1685. His reign was unpopular, owing to his failure to understand the English people and because of his religious views. His

JAMES II

Painting by Sir Godfrey Kneller (1646-1723)

Courtesy British Information Services, N. Y.

persecution of the Covenanters led to a rebellion and the invasion of William of Orange. James was soon obliged to leave England, settling in St.-Germain, France. Louis XIV soon after granted him government support. In 1689 he attempted to regain his dominion in England by invading Ireland, but was defeated in a decisive battle at Boyne in 1690, and returned to St.-Germain, where he resided until his death.

James III, King of Scotland, son of James II, born in 1451; slain June 18, 1488. He succeeded his father on the throne of Scotland under the regency of his mother and at her death, in 1465, came into full possession of the throne. His reign of 23 years was influenced largely by favorites, disturbed by international dissatisfaction, and harassed by the general war spirit of the nobles. James brought the contempt of the warlike nobles upon himself by taking delight in literary pursuits. He was thrown from a horse and murdered while leading the royal army against a rebellion incited by the nobles, who were endeavoring to depose him.

James IV, King of Scotland, son of James III, born Mar. 17, 1473; slain Sept. 9, 1513. He succeeded to the throne of Scotland after the death of his father. Writers generally agree that he possessed marked personal charms. He won popularity by the enforcement of the laws, the encouragement of agriculture, and the dissemination of educational arts. In 1513 he invaded England with a Scottish army, but was slain in battle at Flodden on Sept. 9. He was succeeded by his son, James V (1512-42). The latter was the father of Mary, Queen of Scots.

James, EDMUND JANES, educator and economist, born in Jacksonville, Ill., May 21, 1855; died June 17, 1925. He studied at Northwestern Univ. and subsequently at Halle and Berlin, Germany. In 1878 he was made principal of the high school at Evanston, Ill., and the following year accepted a similar position at Normal, Ill. He was made professor of political and social science in the Univ. of Pennsylvania in 1884, from which position he resigned in 1895 to accept the chair of public administration and direct the department of university extension in the Univ. of Chicago. He was made president of Northwestern Univ., Evanston, in 1902, and two years later became president of the Univ. of Illinois. Among his principal publications are: "Education of Business Men in Europe," "Outline of a Professional School of Political and Social Science," and "Growth of Great Cities."

James, HENRY, novelist and essayist, born in New York City, Apr. 15, 1843; died Feb. 28, 1916. Of Scotch-Irish descent, he was a son of the theologian Henry James and the brother of the philosopher William James (*q.v.*). He was educated in Europe and at Harvard law school. In the early

HENRY JAMES

1870's he established residence in England, and in July 1915 became a British subject. Entering upon his career soon after the Civil War, James provides a study of that section of the "gilded age" which leaned heavily upon Europe. His earliest novels, most of which deal with this group of Americans, include "Roderick Hudson" (1876), "The American" (1877), "Daisy Miller" (1879), "An International Episode" (1879), more properly termed a novelette, and "Portrait of a Lady" (1881). Although James was never widely popular, the sales of his novels increased somewhat during the remainder of the 19th century. Among these may be mentioned "The Bostonians" (1886), "The Princess Casamassima" (1886), "The Tragic Muse" (1890), "What Maisie Knew" (1897), "The Spoils of Poynton" (1897), "In the Cage" (1898), "The Awkward Age" (1899), and "The Ambassadors" (1903).

James's style in his early works was simple and natural. About the turn of the century, however, there appears a considerable increase in complexity. His structure becomes involved, his syntax difficult, his diction tortuous. Plot and action are sacrificed for the sake of character analysis. Among the works of this latter period are "The Sacred Fount" (1901), "The Wings of a Dove" (1902), "The Better Sort" (1903), "The Golden Bowl" (1904), "The Finer Grain" (1910), and "The Outcry" (1911).

James's short stories—delicate, dexterous, and various—were written particularly with the intention of recording the life of his times in as

many separate aspects as possible. Perhaps the two best-known short stories are "The Lesson of the Master" (1892) and "The Turn of the Screw" (1898).

Although James was a discerning literary critic, it is necessary to remember that his critical observations were always made with reference to the particular literary credo which he himself represented. In addition to "French Poets and Novelists" (1878) and "Notes on Novelists, with Some Other Notes" (1914), we should also notice the prefaces which he wrote for the revised collection of his works. In addition to the critical works, there are a life of Hawthorne (1880) and two autobiographical works, "A Small Boy and Others" (1913) and "Notes of a Son and Brother" (1914). His travel works include "Transatlantic Sketches" (1875), "Portraits of Places" (1883), "A Little Tour in France" (1884), and "The American Scene" (1906).

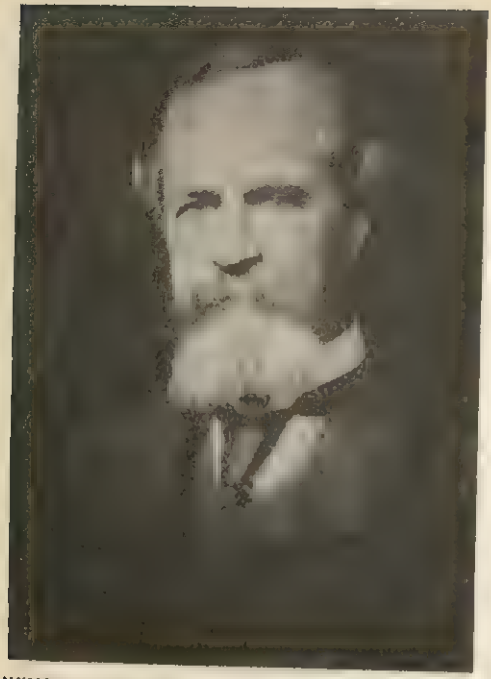
The novels of Henry James have often been criticized for a comparative lack of action, for the devitalized gentility of the characters, and especially for a hyper-refined and minute analysis of character which sometimes leads to a preciosity easily satirized. The fact remains, however, that he has made a classical study of the American abroad. Even more important are his development of psychological analysis and his conscientious study of novelistic form. His perfection of the "point of view," for example, is a milestone in the progress of fictional technique. Master of the "well-made novel," James has been the dominant influence in the technical development of modern fiction.

James, JESSE W., outlaw and bandit, born in Clay County, Missouri, in 1847; died in 1882. He was the son of Robert James, a Baptist preacher, and became reckless because his family was persecuted on account of sympathizing with the Confederates during the Civil War. He joined a Confederate guerrilla band led by William Quantrill and was severely wounded. In 1866 he was outlawed for various criminal offenses, and the remainder of his life was spent in perpetrating bold crimes and in successfully evading capture. Governor Crittenden of Missouri finally offered a reward of $10,000 for his capture, either dead or alive, and he was soon after killed by Robert and Charles Ford, two of his own party, in his home near St. Joseph, Mo. *Frank James,* his brother (1841-1916), was likewise noted as an outlaw and surrendered soon after.

James, WILLIAM, psychologist and philosopher, born in New York City, Jan. 11, 1842; died at Chocorua, N.H., Aug. 26, 1910. James was one of the most distinguished of contemporary American philosophers, his doctrines and personality being influential in various parts of Europe as well as in the U.S. Although he is best known to the general public as a brilliant writer and lecturer in philosophy and as a founder of pragmatism, he had established for himself an international reputation as a psychologist before he became prominent as a thinker on strictly philosophical subjects. From his father, Henry James the elder, he acquired a lasting sensitivity to the travails of men caught up in powerful religious emotions; and he retained a keen appreciation for the consolations which a pious mysticism can bring, even though he rejected the Swedenborgian theology to which his father subscribed. For a while as a youth, he considered art as a career, but the example of his great teacher, the naturalist Louis Agassiz, finally influenced him to decide upon science as a life work. He turned to the study of physiology, and obtained a doctor's degree in medicine from Harvard Univ. in 1870. He began his career as a teacher at Harvard as instructor in physiology, but gradually drifted into psychology, and in 1881 was appointed to the professorial chair in that subject. Under the influence of Darwinian evolutionary conceptions, James became convinced that the mind, like other aspects of organic existence, must have a biological function and survival value; and he maintained that the mind's functioning must therefore be studied as part of the subject-matter of the natural sciences. James thus helped to emancipate psychology from theological preconceptions, and to place it upon a behavioristic basis. His two-volume "Principles of Psychology" (1890), which incorporated and developed these ideas, became almost immediately an influential classic in its field.

The publication of this work marked not only the beginning of a new period for the study of psychology in America; it also marked the beginning of James's career as a philosopher. However, the "Psychology" contains in the germ the most important of his philosophic contributions—in particular, of his *pragmatism* and of his *radical empiricism.*

Pragmatism was for James primarily a method for settling controversy and for conducting philosophical discussion. In his explicit formulation of the doctrine he acknowledged heavy indebtedness to the views of the neglected American thinker, his friend Charles S. Peirce. Nevertheless, the main ideas of James's pragmatism are a direct outgrowth of his biological conception of mind as a function of the body. However, it is essential to distinguish between the pragmatic theory of the *meaning* of ideas, and the pragmatic theory as to the nature of the *truth* of ideas. According to James, since ideas have a biological function their meanings must be sought in the specific functions they exercise. Moreover, in his view ideas are essentially plans of action, so that their function is to bring about a fuller and more satisfactory adjustment of the human organism to its



WILLIAM JAMES

physical and social environment. The meaning of ideas is therefore not to be found in some ethereal, other-worldly realm of being, but must be sought in the particular experimental consequences to which a man is led when he acts on the ideas he entertains. "The pragmatic method," wrote James, "tries to interpret each notion by its respective practical consequences." Two notions or alternatives "mean practically the same thing" if no practical differences result from acting on them. This is the pragmatic theory of meaning. On the other hand, the truth of ideas according to James does not consist in their being faithful copies of things. An idea is true not because it "corresponds" in some literal fashion to the object it is supposed to represent, but only when the idea "works"—*i.e.*, when action directed by the idea brings a satisfactory resolution of the specific problem which initiated the action. This is the pragmatic theory of truth. James attempted to show that a large number of outstanding philosophical problems can be resolved by a consistent application of the pragmatic method. Thus he maintained that "on pragmatistic principles, if the hypothesis of God works satisfactorily in the widest sense of the word, it is true." In his famous essay, "The Will to Believe," he argued that when men are faced with alternatives which cannot be resolved by factual inquiry (*e.g.*, belief in personal immortality as against belief in the complete destruction of human personality on the death of the body), they have the right to accept that alternative which brings the greatest satisfaction and comfort in life.

James' radical empiricism is a doctrine concerning the nature of the world and experience, and it too has its foundations in his psychological theories. The older psychologists had assumed that the mind directly experiences only isolated, atomic data of sense, but that the various connections or relations between these sensory elements are never immediately given in experience. In consequence, philosophers found it impossible to account for the actual connectedness with which things appear, without introducing some extra-experiental factor (such as a Divine Mind) to hold things together. In opposition to this atomistic sensationalism, James maintained that relations between sensory elements are just as much directly experienced as are the elements themselves. "The parts of experience," he wrote, "hold together from next to next by relations that are themselves part of experience. The directly apprehended universe needs, in short, no extraneous transempirical connective support, but possesses in its own right a concatenated or continuous structure." In terms of this simple but profound insight he was able to exhibit the weaknesses of the usual arguments for a monistic conception of the universe, according to which change, freedom, and a plurality of distinct individuals are simply illusory, and are the external appearances of a rigid logical order. For in James' view, the universe possesses at least as much dissonance, spontaneity, contingency, and growth as are directly given in immediate experience, so that the world constitutes a field for genuine human effort and creative activity.

James was hospitable to many beliefs regarded as unorthodox in many professional philosophical circles: to mysticism, popular theism, and psychic research. He maintained that though such views were based on little factual evidence, they had not been disproved by factual study and merited the attention of minds still open to fresh ideas.

James' philosophical writings include "Principles of Psychology" (1890), "The Will to Believe" (1897), "The Varieties of Religious Experience" (1902), "Pragmatism" (1907), "Some Problems in Philosophy" (1911), and "Essays in Radical Empiricism" (1912).

James Bay, the southern part of Hudson Bay. It is 275 m. long from north to south and *ca.* 135 m. wide. The chief Hudson's Bay Co. posts on or near the bay are Moose Factory and Ft. George. Discovered (1610) by Henry Hudson, it was named after Capt. Thomas James (1593-1635) who wintered nearby (1631-32) while searching for the northwest passage.

Jameson (*jām′s′n*), LEANDER STARR, administrator, born in Edinburgh, Scotland, in 1853; died in London, England, Nov. 26, 1917. Educated at the University Coll. Hospital and London Univ. (M.D., 1877), he settled at Kimberley, South Africa, in 1878. He became associated with

Cecil Rhodes in 1890 and soon after settled at Ft. Salisbury, Mashonaland, as a representative of Rhodes and the British South Africa Co. He led (1895) the Jameson raid on the Boer colony in the Transvaal but was captured and turned over to English authorities for punishment. After serving 15 months in an English prison, he returned to South Africa, where he was (1900-02) a member of the Cape Colony Parliament and premier (1904-08) of Cape Colony. His interest in uniting the colonies of South Africa led him to play a large role in the South African National Convention (1908-09) which was instrumental in setting up the Union of South Africa.

Jamestown (*jāmz'town*), a city of Chautauqua County, New York, on the southern end of Chautauqua Lake, 57 m. s.w. of Buffalo. It is on the Erie and New York Central R.R.'s in an agricultural area of truck and dairy farms. Jamestown manufactures machinery, furniture, worsted goods, hand tools, casement windows, automobile radiators, steel doors and partitions, glass, and malleable iron products. Settled in 1810, it was chartered as a city in 1886. The Chautauqua Institution (*q.v.*) is 17 m. away. Population, 1950, 43,354.

Jamestown, county seat of Stutsman County, North Dakota, 95 m. w. of Fargo, on the James River. Located on the Northern Pacific Ry. and Midland Continental R.R. in fertile farming country, it is a shipping center for wheat and livestock. Its industries include grain elevators, stockyards, and railroad and machine shops. Jamestown Coll. was founded here in 1883. Jamestown was settled in 1871. Population, 1950, 10,697.

Jamestown, the locality in James City County, Va., where the first permanent English settlement in America was established in 1607 by the London Co. Originally on a peninsula, it is now on Jamestown Island (created by the fluctuations of the river) in the James River, *ca.* 35 m. N.W. of Norfolk. The colonists, under the leadership of John Smith (*q.v.*), underwent severe hardship and were saved only by the arrival of more supplies and colonists. The introduction of tobacco culture in 1612 by John Rolfe (*q.v.*) helped put the settlement on an economic footing. The capital (1607-98) of Virginia, Jamestown was the scene (1619) of the first representative legislative assembly in the New World—the House of Burgesses. Jamestown was burned during Bacon's Rebellion (1676) and was later rebuilt, but it declined after 1699 when Williamsburg became the capital. Some relics of its early settlement still remain, such as the church tower (*ca.* 1639) and the cemetery. The 300th and 350th anniversaries of the founding of the settlement were celebrated in the Jamestown Expositions of 1907 and 1957, respectively. The 1957 festival was attended by Queen Elizabeth II, of England.

Courtesy Virginia Conservation Com.

OLD CHURCH TOWER AT JAMESTOWN, VA.

Jamestown Weed, the original name, now rare, of Jimson weed (*q.v.*). The name derives from Jamestown, Va.

Jammes (*zhăm*), FRANCIS, poet and novelist, born in Tourney, France, Dec. 2, 1868; died in Hasparren, Nov. 1, 1938. After his father's death, he abandoned his law studies at Bordeaux and went to the Pyrénées, where he spent most of the rest of his life. Grouped with the symbolist poets, he revealed in his early poems a love of nature and animals. After his return to the Catholic faith in 1905, he dealt mainly with religious themes. His works include "From the Morning Angelus to the Evening Angelus" (1898) and "Christian Georgics" (1911-12).

Jamnia (*jăm'nē-ŭ*), the later name of JABNEEL, a town on the northern border of Judah that was sacked by Judas Maccabaeus and later rebuilt. It was a cultural center of the Jews and a seat of their rulers. There are many Biblical references to it, including Joshua 15:11 and 19:33 and II Chronicles 26:6; it is also spoken of in the books of Maccabees.

Jane Eyre (*jān ār*), a novel by Charlotte Brontë (*q.v.*), published in 1847. Partly autobiographical, it mirrors the life of early Victorian days.

Janesville (*jānz'vĭl*), seat of Rock County, Wisconsin, on the Rock River, 32 m. S.E. of Madison. It is on the Chicago and North Western and the Chicago, Milwaukee, St. Paul &

Pacific R.R.'s. The chief buildings include a museum, a public library, and the state school for the blind. Janesville has diversified commercial interests and manufactures pens and pencils, automobiles and trucks, cotton garments, flour and soybean by-products, prefabricated houses, and venetian blinds. The surrounding country produces tobacco and dairy products. Janesville was settled in 1837 and incorporated as a city in 1853. Population, 1940, 22,992; in 1950, 24,899.

Janeway (*jăn'wâ*), EDWARD GAMALIEL, physician, born near New Brunswick, N.J., Aug. 31, 1841; died Feb. 10, 1911. He was graduated from Rutgers Coll. in 1860, and subsequently studied at the Coll. of Physicians and Surgeons in New York City, where he was awarded a degree. In 1864 he began a successful practice of medicine. He was made dean of the University-Bellevue Medical Coll. in 1898. For some time he was health commissioner of New York City. He served as president of a number of scientific and professional societies, including the Association of American Physicians. His success was attained in treating diseases of the chest and abdominal organs.

Janis (*jăn'ĭs*), ELSIE, theatrical name of ELSIE JANIS BIERBOWER, actress, born in Columbus, Ohio; died in Beverley Hills, Calif., Feb. 26, 1956. She starred in "The Belle of New York" (1904) and "The Vanderbilt Cup" (1906-07), appearing with great success in New York and London. In World War I, she entertained American troops overseas, becoming known as "The Sweetheart of the A.E.F." She also appeared in "The Hoyden" (1907), "The Fair Co-ed" (1908), "A Star for a Night" (1911), and "The Lady of the Slipper" (1913). She wrote and played in "The Slim Princess" (1910) and "Elsie Janis and Her Gang" (1920) and produced two volumes of verse.

Janizaries (*jăn'ĭ-zâ-rĭz*), a corps of Turkish infantry organized by Sultan Orkhan in 1330. It was the first regular standing army organized by the Turks, was comprised largely of children captured from Christian parents and brought up as Mussulmans, and was used principally for garrison duty. According to an edict, they were provided with no habitation but their quarters, were forbidden to marry, enjoyed numerous special privileges, and took the field only when the sultan was in command. The army of Janizaries numbered 10,000 in 1362, but later developed a strength of 100,000 men, while the irregular militia included 350,000. Their remarkable bravery and daring won Ottoman victories for more than two centuries, but later they degenerated into lawless and insubordinate bands, and planned several successful plots to assassinate Turkish nobles and sultans. In the War of 1826 with Russia they revolted, which led Mahmoud II to determine upon their destruction. Large numbers were banished by proclamation and others were executed, but those remaining made a desperate resistance. Sixteen thousand were killed; 7,000 were burned in barracks. In the organized military forces of Turkey they were succeeded by the *nizam*, the regular Turkish army, organized and disciplined on the general plan adopted by European powers.

Jansenism (*jăn'sĕn-ĭzm*), one of the Reformatory movements within the Catholic Church. The movement was founded by the bishop of Ypres, Cornelis Jansen (1585-1638), who fought against certain prevailing concepts of the Church and tried to revive certain doctrines of St. Augustine. Some Jansenist tracts appeared, but they did not have great influence and were condemned by the Popes. Finally, Pasquier Quesnel (1634-1719) published works representing the Jansenist point of view. Against him, Pope Clement XI issued the bull "Unigenitus" (1713), which in turn caused resentment on the part of the French bishops. The influence of Jansenism was greater in contemporary writing (*e.g.*, Pascal's "Lettres provinciales") than within the clergy proper.

January (*jăn'ū-ĕ-rĭ*), the first month of the year in the Gregorian calendar. It is named from Janus. According to Roman tradition it was first added to the calendar, together with February, by Numa. Originally it had 29 days, to which Julius Caesar added two more. The Roman year originally consisted of only 10 months and began with March. It was known by the Scandinavians as the month of Thor. The Parliament of England, in 1751, made January the first month of the year.

Janus (*jā'nŭs*), a Roman deity worshiped with utmost affection and veneration. He is regarded as the most ancient King of Italy, a ruler of wisdom and moderation, on account of which he was deified and the first month of the year was named in his honor. Being endowed with knowledge of all the past and the future, he was able to adopt the wisest measures for the welfare of his subjects, and, on this account, is represented in statuary with two faces—the one looking to the past and the other to the future. Janus was not honored by the building of temples; instead, all the gates of the cities were dedicated to him. The most massive gate thus dedicated was at the Forum of Rome, which was open only in the time of war. However, Roman wars were so numerous and extended that the gates of this sanctuary were closed only three times within 700 years. In ancient paintings he is represented as the doorkeeper of heaven, bearing a key in one hand and a rod and scepter in the other.

Japan (*jâ-păn'*), or NIPPON, an island empire of Eastern Asia, situated in the Pacific Ocean, east of Korea. It consists of a chain of islands located N. of the Philippines, from which it is

separated by the Bashi Channel, and its western shore is washed by the Sea of Japan. The entire archipelago consists of an immense number of islands, about 4,000, all of which appear to be the more elevated portions of a partially submerged mountain system. These islands, which

Courtesy Japan Railways

MOUNT FUJI

embrace Japan proper, include 500 that are inhabited. The Empire of Japan is made up of four main islands as follows: Honshu (mainland), Kyushu, Shikoku, Hokkaido (Yezo). It also includes Sado, Oki, Awaji, Iki, and Tsushima. The Ryu Kyu (Loo-choo Islands) and Ogasawarajima (Bonin Islands) are administered by the U.S.

The following table contains a list of the principal divisions of Japan, together with the area:

Division	Area Sq. M.
Iki	53
Oki	153
Tsushima	271
Awaji	299
Sado	331
Shikoku	7,248
Kyushu	16,247
Hokkaido	34,276
Honshu	88,919

Description. It may be said that the main group of islands is crescent-shaped, with the convexity toward the Pacific Ocean, the several portions being separated by narrow channels in which there are numerous islets. The coasts are indented by many gulfs and bays, but possess few good harbors. In most of the islands the coasts rise abruptly from the sea in rocky precipices, which continue in the form of mountain chains and diversify the surface with marked elevations, alternated with beautiful and fertile valleys. The dormant volcanic mountain Fujiyama (or Fuji-San), situated on Honshu, 60 m. s.w. of Tokyo, rises 12,425 ft. above sea level and is the culminating point of the Japanese group of islands. Lofty ridges extend in a general direction from north to south through the central part of Honshu and Kyushu. Numerous active volcanoes occur in different localities, while earthquakes are frequent, the most damaging disturbances on record occurring in 1707, 1783, 1792, and 1923. In the earthquake of 1923, about 150,000 people were killed. Along the streams and near the coast are level tracts of land. Tall grasses and forests occur in the mountains and where the land is not cultivated.

The islands being narrow and mountainous, Japan has no long rivers, though all parts of the country are well watered. Streams or streamlets furnish drainage in all of the valleys, which contain many beautiful cataracts and waterfalls. The Ishikari, in Hokkaido, is the longest stream. It drains most of the central part, has a course of 407 m., and discharges into the Sea of Japan. The Shinanogawa, in Honshu, flows northwest into the Sea of Japan, after a course of 320 m. Few of the other streams exceed a length of 100 m., and most of them are rapid and furnish navigation for only short distances. Numerous lakes are located in the larger islands, but only few are of any great extent. Lake Omi, in the south central part of Honshu, is 37 m. long and 10 m. wide. It is famed for its beauty, and is much visited by tourists in the summer season.

Climate. Owing to the vast extent in latitude, the physical features are variously marked by climatic influences. On the other hand, snow and ice are never seen in the Loo-choo group, where the heat is great and the conditions are subtropical. In Honshu and the central part of the country, the climate is equable and moderately temperate, partly because of the warm currents in the Pacific Ocean. Although snow falls in Kyushu and the southern part of Honshu, it remains only a short time, but in Hokkaido and the northern part of Honshu the winters are quite severe. Although the country has an abundance of rainfall, precipitation depends largely upon the winds, so that some parts of the year are quite dry. The heaviest rains occur in June and September, and in some parts of the year it is necessary to resort to irrigation. At Hakodate the annual fall is 57 in.; at Yokohama, 70; and at Tokyo, 65. In general the climate is healthful, though the temperature frequently rises to 96° F. in the summer.

Flora and Fauna. Japan is rich in the variety and luxuriant growth of its plants. Many of the species known to us as garden plants grow wild in different sections. These include the bluebell,

violet, gladiolus, iris, and lily of the valley. The ferns are well represented and about 150 species of evergreen trees abound. Among the forest trees are the holly, cypress, yew, box, myrtle, camphor tree, mulberry, maple, birch, banyan, wax tree, lacquer tree, and many species of bamboo. Flowering plants are numerous, both wild and cultivated, and the Japanese are noted for their festivals in which flowers play a leading part. Many shell and fin fishes abound in the streams and coastal waters, including numerous species that are important in the industries. Among the mammals are the fox, wolf, black bear, weasel, flying squirrel, hare, and deer. The birds of song and plumage are abundant, including about 360 species. Flies, cicadas, crickets, and other insects are numerous. There are many species of monkeys in the southern part of the country. The reptiles are represented by 300 species, including numerous snakes, frogs, and lizards.

Mining. Though not especially rich in minerals, Japan has considerable mining interests. Coal is mined extensively in Kyushu and Hokkaido and is found in various other parts of the country. Iron ore occurs in nearly all the islands and copper is also well distributed. Silver mines are worked in Honshu and gold is obtained chiefly from the alluvial sands and gravels, though auriferous quartz exists in Sado and various parts of Honshu. Petroleum has been obtained in small quantities since the year 668 A.D. Other mineral products include lead, manganese, antimony, sulfur, graphite, tin, salt, and mercury. Granite and other building stones occur in many sections of the country, but they are not used extensively at present in general building, aside from the construction of bridges and aqueducts.

Fisheries. The Japanese depend in a large measure upon the fisheries for their supply of food, since rice and fish are indispensable and economical. Many species abound in the fresh and salt waters, and the abundance and variety seen in the markets are not surpassed in any country of the world. Fishes of the mackerel family are most numerous, and the golden bream is the most prized. Many salmon-curing establishments are maintained, but they are most abundant in Hokkaido. Several large plants for the hatching and rearing of fish are operated under the supervision of the government as a means to replenish and maintain the supply. Sperm whales infest the waters of the northern section, yielding an abundance of ambergris. Other classes of fish include the shad, trout, flounder, halibut, sturgeon, haddock, sole, perch, and turbot. Economically important is the practice of artificial pearl culture.

Agriculture. Farming is the chief industry, nearly half of the inhabitants being engaged in agriculture. Rice is the staple food and the principal crop. Fully 215 species are cultivated, and rice land is worth about three times as much as any other arable land. The annual production of rice is about 9,500,000 metric tons. Much of the product is used in the manufacture of sake, the beverage consumed most extensively. A large area is utilized in the cultivation of the tea plant, and the production averages about 54,800 metric tons of tea per annum. Other products include corn, pulse, millet, buckwheat, tobacco, rye, wheat, barley, and vegetables. Large interests are vested in the production of cotton, sugar, indigo, hemp, and silk cocoons. It must be noted that the variety of crops is very great, owing to the extent of the country in latitude, but the productions of any one section are not so greatly varied as would seem from the list of crops assigned to the entire country. To the list of productions enumerated above must be added a large number of fruits, such as the orange, persimmon, plum, banana, apple, coconut, grape, and strawberry. Sugar cane is an important product in the southern section.

Formerly little attention was paid to the rearing of herds and flocks, owing to the fact that the religious teaching of the Buddhists forbids slaughter. However, the government today actively promotes the livestock enterprise, and experimental farms are maintained to breed cattle, horses, and sheep. Butter, cheese, and milk were formerly unknown, but dairying has been introduced, and much attention is given to the rearing of cattle for milk and meat. Horses have likewise come into extensive use. Sheep rearing is promoted profitably in the elevated regions where farming is otherwise unprofitable.

Manufactures. Manufactures of all kinds are important in the country's economy. Japan, like China, continues to hold a high place in the production of fine ceramics, wood, stone, and bone carving, lacquer work, and inlaid articles. Paper, silk, and cotton textiles, machinery, and clothing are manufactured on a large scale. Shipbuilding was formerly an important enterprise at Nagasaki, a port of Kyushu. Sake and soy brewing, salt making, and the manufacture of sugar and tobacco are important industries. The last is controlled by the government. Other manufactures include gunpowder, earthenware, matches, fireworks, chemicals, and cotton and silk textiles.

As a general rule the factories are comparatively small and employ an average of from 40 to 50 men, though the aggregate capital invested is extensive. For many years the large machinery used in manufacturing and in agriculture was imported from America and Europe, but the rapid strides made in education and the industrial arts have led to a utilization of the native

resources. Postwar industrial rehabilitation has been good, but technological modernization is still much needed and is to a large extent dependent upon attracting foreign investment. Although textiles remain the leading export industry, by 1955 more synthetic fibers were being produced and fewer cotton goods; there was also greater diversification in production for foreign trade, with optical equipment, plastics, and light machinery making spectacular gains. In order to develop her exports further, Japan is stressing production of chemicals and heavy industrial items. In 1953 Japan had more than 168,000 factories employing four or more, and the total number of workers and salaried persons employed in these plants was 4,319,000.

Transportation. Japan's first railway, between Tokyo and Yokohama, was opened by the government in 1872. Today, there are *ca.* 17,257 m. of railroads in operation. The long coast line, fostering domestic shipping, and the need for foreign trade made Japan's merchant marine third in world rank before World War II; by 1954 she had recovered sufficiently to reach seventh place in shipbuilding; and more than 300,000 gross tons of vessels were launched in the first half of 1955. There are *ca.* 87,000 m. of roads and highways. Some dozen domestic airlines are in operation.

Economy. Able to grow food for only *ca.* 80 per cent of her people and faced with an annual population increase of 1,000,000, Japan must buy food abroad, as well as textile fibers, fuels, and metals. She must pay for these through large-scale exports. Today, as in the past, her economy is heavily dependent upon foreign trade, but where she formerly had access to overseas areas for raw materials, today she has lost her empire, plus the important markets of China, North Korea, and Manchuria. Although normally imports were somewhat greater than exports, she is now caught in an extremely adverse balance-of-payments situation, her imports in 1954 exceeding her exports by $770,000,000. Stringent financial measures to stabilize her economy had some degree of success. Domestic inflationary tendencies were accelerated in 1951, however, with the creation of the wartime market in Korea. The Korean boom, nevertheless, cushioned the end of direct U.S. financial help, which had amounted to more than $2,000,000,000 by that time. In 1955 Japan managed to improve the competitive price of her exports by lowering the general price level by two per cent through stricter fiscal and monetary policies (entailing an end to government borrowing). These measures, along with cuts in corporation- and income-tax rates, were the first steps in the government's program to bring the external trade balance into equilibrium by 1960.

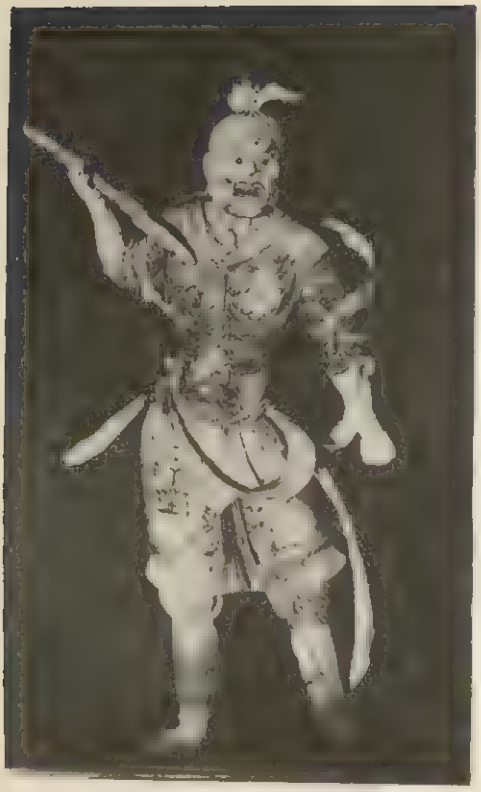
Courtesy Canadian Pacific Steamships

PRIESTS AT THE NIKKO TEMPLE GATE

Government. Japan is a constitutional monarchy based on the constitution of May 3, 1947. The emperor, Hirohito, once venerated as divine, has been maintained as a symbol of the state but has no power related to government; he can act only under the direction of the Diet. The Japanese Diet (parliament), a bicameral legislative body, consists of a 467-member house of representatives and a 250-member house of councilors, all elected by secret ballot through universal adult suffrage. The members of the house of representatives serve for four years, the members of the house of councilors serve for six years. Executive power is vested in a cabinet headed by the premier, who is designated by the Diet and formally appointed by the emperor. An independent judiciary is headed by a 15-member supreme court. For purposes of local government the country is divided into 46 prefectures (Hokkaido is not included). Local self-government includes direct election of governors and officers of lesser local units, as well as powers to tax and legislate. Human rights are guaranteed under the constitution by a Bill of Rights.

Although the 1947 constitution renounced war and outlawed an armed force, the peace treaty of September 1951 permitted Japan to rearm. The defense force authorized by the Diet in 1954 comprises the equivalent of a 139,630-man army (1954), a 10,572-man navy (1953), and a 6,765-man air force (1954).

Education. School attendence is free and com-



TERRA COTTA STATUE OF THE 8th CENTURY
From the temple of Kokkedan, Todeiji

pulsory for children between 6 and 15. In 1954 Japan had 22,036 elementary schools, with 11,750,923 pupils, and 15,907 secondary schools, with 8,209,032 pupils. In 1954 there were also 227 colleges and universities, including six universities formerly known as the Imperial Universities: Tokyo Univ., Tokyo; Kyoto Univ., Kyoto; Tohoku Univ., Sendai; Kyushu Univ., Fukuoka; Hokkaido Univ., Sapporo; and Osaka Univ., Osaka. University enrollment totaled 491,543 in 1954. Tokyo Univ., founded in 1877 (reorganized in 1886 as Tokyo Imperial Univ.), is the outstanding institution of learning. Japan's literacy is estimated at 99 per cent. The 186 daily newspapers (1952) are widely read, as are books and magazines. Translations from foreign literature and foreign films are popular. The country has almost 4,000 public libraries.

Religion. Shintoism and Buddhism (*qq.v.*) are the predominant religions. State Shinto, a patriotic cult stressing emperor worship and glorification of the nation, was abolished in 1945 upon the orders of the occupation authorities. Emperor Hirohito issued a rescript on New Year's Day 1946 denying the concept of the emperor's divinity. Sectarian Shinto, flourishes, however. Confucianism, once the third-ranking religion, has now been outdistanced by Christianity; churches and mission stations are supported by all the leading Christian denominations. In 1950, 16 Protestant denominations were represented; Catholics were sufficient to require the presence of an archbishop and three suffragan bishops.

Characteristics. The Japanese people are believed to be a mixture of the Malayan peoples of the islands situated toward the south with emigrants from Korea and possibly with peoples from other areas on the Asian mainland. Essentially Mongoloid, they have straight, black hair, slanting, dark-brown eyes, an oval face, and round head. They have short legs and are generally short by Western standards. They speak various dialects of the same tongue, the written language being far more formal than the spoken. The population includes some 15,000 Ainu, living mostly on Hokkaido and speaking their own language. The Ainu were probably the first inhabitants of Japan and seem to have been of the white race. They are thought to have contributed to the Japanese stock the face and body hair that is more profuse than is characteristic of other Mongol peoples, as well as the wavy hair often found in southern Japan.

The Japanese attach great importance to cleanliness, and the daily hot bath is a ritual; large public baths for this purpose are found in all towns and cities. Fish and rice are the principal items of food; tea is the great national beverage and much ceremony is associated with its preparation and service; sake, a rice-beer, is the chief alcoholic drink.

Japanese life has long been characterized by adherence to a complicated etiquette directed toward maintaining "face" and by emphasis on group and family loyalty. One of the favorite themes of art, literature, and drama, the "Forty-seven Romin," concerns an actual incident of *ca.* 1701, in which the loyalty of 47 samurai (retainers) led them to avenge the enforced suicide of their feudal lord. The position of the father and men in general has been exalted; women have been subordinated. Nevertheless, even before Japan's occupation, urban industrialization had liberated some of the younger generation, and many women had become office and factory workers. Women had no political rights, however, until 1945 when occupation authorities directed the government to enfranchise them; the 1947 constitution and subsequent legislation gave them legal equality.

The dress commonly worn by both Japanese men and women has undergone marked changes within recent decades. The footwear consists of a small sock, called a *tabi,* which has a separate compartment for the great toe,

and is ankle high. Comparable to occidental shoes are the straw sandals or *zori,* and the wooden clogs or *geta.* Though the footwear of men and women is the same, there are marked differences in the headgear and dress. In 1886 a national law was enacted requiring the government officials to wear European dress when on duty, and women of the higher classes began to appear in public in European garments. Since then dress reform has been advancing rapidly even in the lower classes, and the former garments, somewhat allied to the ancient Chinese, have either become modified or are fast disappearing, at least so far as men are concerned.

All classes of the people are required by law to secure at least an elementary education. Tobacco smoking is common among both men and women. *Ikebana,* or artistic arrangements of flowers and foliage, are favorite decorations for all public places and the home. Typical Japanese architecture is ornamental but lacks solidity. Houses built in Japanese style have absolutely no protection against fire. While their builders are skilled as turners, joiners, and carvers of wood, they lack a knowledge of the more substantial and serviceable aspects of architecture. Most of the furniture is plain and simple and is kept unpainted. The employment of European and American engineers and architects brought about revolutionary movements in the construction of public buildings, harbors, and aqueducts, and in shipbuilding. In the big cities modern forms af masonry and the use of steel are rapidly displacing the looser and less durable Eastern style. The *jinrikisha,* a two-wheeled carriage with two shafts, drawn by a man, is still a common vehicle for conveyance, though street railways, carriages, bicycles, and automobiles have come into common use in the larger cities.

Water buffaloes are used as beasts of burden, while the horse and ox serve mostly for agriculture and draft purposes.

Inhabitants. Comparatively little is known of the population of Japan before 1872, when the first reliable census was taken. At that time the inhabitants numbered 33,110,825. Since then the country has not only become more populous by the extension of territory, but there has been an increase through the excess of births over deaths. Within the last quarter of a century the urban population has increased noticeably, owing chiefly to the larger developments of the factory system. Tokyo, in Honshu, is the capital and largest city. Other cities of importance include Yokohama, Nagasaki, Osaka, Hiroshima, Kobe, Sendai, Hakodate, and Kyoto. About 80 cities have a population of over 20,000. Japan, in 1920, had a population of 55,751,919; 1931, 90,396,410; in 1947, it was estimated at 78,827,000.

History. The legendary history of Japan dates

COLOR PRINT BY KITAGAWA UTAMARO
One of the great Japanese artists of the 18th century

from 660 B.C., but authentic history begins in 500 A.D. Jimmu Tenno is the reputed founder of the present dynasty and, according to Japanese historians, ascended the throne in 660 B.C. Empress Jingo invaded Korea in 201 A.D., from which time Japanese civilization can be said to date. The *Rongo* and *Senjimon,* two sacred Chinese books, were introduced into Japan in 285 by the Koreans. Buddhism gained a foothold in 552 and became the established religion in 595, and in 624 the government established a Buddhist hierarchy. Chinese civilization was assimilated largely through commercial relations, and after 646 great strides of advancement were made in government, science, and educational arts.

The Fujiwara family established a superior form of civil service several centuries before 792, but by that time the military classes rose, and Yoritomo became *shogun* or generalissimo. While he was not recognized as the person in whom the reigning power was vested, he really governed, but paid homage to the Mikado, who was regarded as the spiritual emperor. At that time the spirit of militarism spread to all parts of the dominion. In many cases the Buddhist monasteries even became military centers, which continued until 1603, when Tokugawa Iyeyasu

Courtesy Museum of Fine Arts, Boston

DETAIL OF A SCROLL BY CHOSUN

Ukiyo-ye school, 18th century

instituted an era of peace by reason of his superior statesmanship. He made Yedo (now Tokyo) the capital and center of power, from which his lineal descendants governed until 1868. This dynasty, known as the Tokugawa, repelled the Portuguese invasion in 1638, prevented the spread of Christianity, built great cities, and maintained a commerce and interior development distinctly Japanese, excluding entirely all classes of foreigners.

In 1853 Commodore Perry entered the harbor of Uraga with a U.S. squadron. He secured a treaty with the shogun, on Mar. 31, 1854, which caused Japan to be opened to the commercial nations after its seclusion for 216 years. Since then modern civilization and arts have literally flooded Japan. The feudal system that rose under military fiefs was overcome largely. In 1867-68 the shogun was overthrown and replaced by a powerful empire under the Mikado. Yedo was renamed Tokyo, a constitution was granted in 1889, and modern arts were introduced in every branch of the government and the industries.

The effective strength of the Japanese military force was ably demonstrated in the Sino-Japanese War in 1894-95. This war resulted from internal dissensions in Korea, in 1894, which were incited largely by the factions of Japanese and Chinese in that country. Each of these respectively appealed to Japan and China for aid to quell insurrections, and, as each complied, a formal war was declared in August. A Japanese army promptly invaded China, while its navy destroyed that of the Chinese within a period of three months. The loss of immense stores and 25,750 men prompted China to ask for peace early in February 1895. The conditions of the treaty ratified a month later provided for a cash war indemnity of $150,000,000, the independence of Korea, and the cession of Formosa to Japan. Among the important events occurring since are those in relation to commercial treaties with other nations, the extension of vast internal improvements, and the prominent part taken in the Chinese War of 1900-01.

In 1904 Japan became involved in a war with Russia, because the latter country had occupied Manchuria. Important battles were fought early in May on the Yalu River, where Gen. Kuroki with a large army defeated the Russians under Gen. Sassulitch. The Japanese captured Port Arthur in 1905. Japan won the great Battle of Mukden, and Admiral Togo destroyed the Baltic fleet. The peace treaty was signed at Portsmouth, N.H., with President Theodore Roosevelt of the U.S. acting as mediator. Subsequently Japan suppressed a rebellion in Formosa, absorbed Korea, and strengthened its position in Manchuria. Declaring war on Germany, Aug. 23, 1914, Japan fulfilled a treaty of alliance signed with Great Britain in 1904 and thus became an ally of the victors. After the war her trade and industry mushroomed, and her nationalistic pride grew more intense. She felt the insult greatly when the U.S. passed the anti-Japanese immigration laws. Her role as a world power was strengthened when she received mandatory powers over all ex-German Pacific possessions, assigned to her by the League of Nations. Soon militaristic groups led by Baron Giichi Tanaka and aided by secret

societies, such as the "Black Dragon," began to propagandize for a Japanese-dominated "Greater East Asia" and a "Far Eastern Co-prosperity Sphere" (see *Far Eastern Question*). In line with this policy, Japan, in the early 1930's, began hostilities against China (see *Manchuria*) which finally developed (1937) into a full-fledged war (see *China*). Dissatisfied with a 5:5:3 ratio in naval armaments which Great Britain and the U.S. had conceded in 1930, Japan repudiated all limitations in 1935. Her adherence to the German-Italian Anti-Comintern Pact (1936) and the conversion of this pact into one of military assistance (1940) lined Japan up against the democracies. Her continued aggressions in the Far East caused the U.S. to seek a peaceful solution to Japan's demands. Negotiations were still under way in Washington, D.C., when Japanese planes launched (Dec. 7, 1941) a surprise attack against Pearl Harbor, U.S. naval base in Hawaii, followed by attacks on other American and British holdings in the Far East. This attack drew the U.S. and Japan into World War II. In January 1942, the Japanese invaded New Guinea and landed on the Solomon Islands, northeast of Australia. The Battle of the Java Sea (February) ended in the Japanese occupation of Java. Within six months Japan had overrun Guam, Wake Island, the Philippines, the Netherlands East Indies, Burma, Malaya, Singapore, the Bismarck Archipelago, Hong Kong and several of the Aleutians.

Slowly the Allies began to gather strength for offensive warfare. American bombers raided Tokyo, Yokohama, and other cities for the first time on Apr. 18, 1942. Allied forces defeated a Japanese fleet in the Coral Sea on May 8, 1942, won the Battle of Midway. Island on June 5-7, 1942, and established a beachhead on Guadalcanal, in the Solomons, in August. The battle fought by sea, air, and land on Oct. 28-30, 1942, in the Solomons area and the naval engagement off Savo Island in November resulted in victories for the United Nations. In the ensuing months, Gen. Douglas MacArthur, commander of the United Nations forces in Australia and the Southwest Pacific since March 1942, and Adm. Chester William Nimitz, commander of the U.S. Pacific Fleet since December 1941, directed their men in a campaign of "island hopping," aimed at the occupation of Japan proper. In the North Pacific, too, the Japanese were beaten back, being forced from strongholds they had established in the Aleutians (*q.v.*).

Thereafter the power of the Allies, primarily of the U.S., increased rapidly in strength and in aggressiveness and of the many victories gained over the Japanese the following are the most representative: Rendova Isle, Central Solomons, June 1943; Bougainville, Solomons, November 1943; Tarawa, Gilberts, November 1943; Green Isles, north of Bougainville Island, February 1944; Saipan, Marianas (gateway to Tokyo), Summer 1944; the reconquest of Guam, Summer 1944; Peleleu Islands, September 1944; the reconquest of the Philippines (commenced October 1944),

AT THE RUSSO-JAPANESE PEACE NEGOTIATIONS, 1905

Japanese and Russian envoys met on the yacht of President Theodore Roosevelt to negotiate the terms of the treaty. The successful conclusion of the war and the accomplishment of the Anglo-Japanese alliance definitely brought Japan into the ranks of the great powers

Iwo Jima, March 1945, and Okinawa, April 1, 1945. Whittled down by Allied air forces and fleets, the Japanese navy suffered most heavily in engagements such as the Second Battle of the Philippines (October 1944) and in the Japanese Inland Sea (March 1945). Also successfully attacked in Burma (*q.v.*), Japan held her gains in China. At the end of 1944, U.S. bombers initiated a vigorous air attack over Japan proper which destroyed Japan's industrial capacity and made defeat inevitable. Russia declared war on Japan (Aug. 8, 1945) and invaded Manchuria and Korea (*qq.v.*).

When Japan refused the Allied surrender ultimatum in the Declaration of Potsdam (July 26, 1945), an atomic bomb (*q.v.*) was dropped on Hiroshima (Aug. 6) and another on Nagasaki (Aug. 9), almost wiping those cities off the earth. Japan surrendered almost immediately (Aug. 14, 1945), and was permitted to keep its emperor under the authority of the Allied supreme commander—a post held by Gen. Douglas MacArthur from 1945 to 1951, when he was succeeded by Gen. Matthew B. Ridgway (*qq.v.*). Japan was occupied, her military leaders were tried as war criminals, and territories she had conquered in the past 50 years were liberated or returned to their previous owners. Under Gen. MacArthur, a program of democratization was begun, touching upon all phases of Japanese life, including the institution of the emperor. In 1946 the first free general election since 1932 was held, and in heavy balloting the conservative parties won over liberal groups. A new constitution approved by Gen. MacArthur was voted by the Japanese diet in 1946 (effective 1947), which vested sovereignty in the people and renounced war as an instrument of national policy.

A peace treaty between Japan and most of her former enemies was concluded in San Francisco, Calif., in 1951, and was followed by separate treaties with several other countries, but not with nations of the Soviet bloc. Although attempts to obtain a formal treaty with Russia have been unsuccessful, a joint Japanese-Soviet declaration of 1956 ended the state of war between them. A U.S.-Japan security pact (1951) permitted the U.S. to station defense forces in Japan until she was fully rearmed. In 1954 the diet approved a 164,000-man defense force and a mutual defense pact with the U.S., and in 1955 the U.S. began gradual withdrawal of its forces as Japan began to assume responsibility for her own defense.

DESTRUCTION IN NAGASAKI—AUG. 9, 1945
After the atomic bomb attack

JAPAN JOINS U.N.

Foreign Minister Mamoru Shigemitsu (who died five weeks later) addresses the U.N. General Assembly on Dec. 18, 1956, as Japan becomes the 80th member of the international organization

Japan's postwar economic recovery was made possible by large-scale U.S. assistance, but gains were made—though slowly—in increasing production and foreign trade; the latter expanded to include, in addition to textiles (the largest export item), optical equipment, plastics, steel flatware, and light machinery. Although in 1953 it was still necessary to import 18.7 per cent of total food needs, the standard of living was rising. At the same time, the index of industrial production rose to 216.3 in 1956 (1934-36=100), a gain of 15 per cent over 1955.

Following the first postwar election, the conservatives remained in power and gradually carried out democratic reforms. Among the opposition parties was the Communist party, 24 members of which were barred (by the Occupation) from holding positions in the government, labor unions, and the press. The Communist party was not outlawed, however, and continued to be represented in the diet. In 1958 the pro-Western conservatives (Liberal-Democrats) gained their sixth election victory since 1946, indicating the stable political situation which had developed in Japan.

Japan, SEA OF, an extension of the Pacific Ocean, separating the islands of Japan from Korea, Manchuria, and the southernmost part of the U.S.S.R. (Maritime Territory). The area of the sea is *ca.* 405,000 sq. m. It is connected with the Sea of Okhotsk by the Gulf of Tatary and Tatar Strait on the north and by Soya Strait on the northeast; with the Pacific by Tsugaru Strait on the east; and with the East China Sea by Korea Strait on the southwest.

Japan Current (*jä-păn′ kŭr′ĕnt*). See *Kuroshio.*

Japanese Beetle (*jăp-ą-nēz′ bē′t'l*), a small green and brown beetle of the scarab family, introduced to North America from Japan and currently a widespread plant pest in the U.S. The larvae feed on plant roots, particularly grasses; the adult insects on leaves and fruits. See color plate, *Beetles of North and South America,* Volume II.

Japanning (*jä-păn′ĭng*), the art of coating articles of wood, leather, metal, or papier-mâché with japan or other hard, brilliant varnish. The process is an imitation of Japanese and Chinese lacquering. The object to be japanned is covered with several priming coats of varnish, followed by a coat tinted to the desired ground color. Designs are then applied and covered with several finishing coats of varnish. Each coat is dried under high temperature to achieve a hard, durable surface.

Japheth (*jā′fĕth*), a son of Noah, born when his father was 500 years old. To Japheth, Noah gave the prophetic blessing, "God shall enlarge Japheth, and he shall dwell in the tents of Shem; and Canaan shall be his servant" (Genesis 9:27). Japheth's sons "divided the islands of the Gentiles" (Genesis 10:5), taken to mean the countries remote from Judea.

Japurá (*zhä-pōō-rä′*) or YAPURÁ, a river of South America. It rises in southwestern Colombia, where it is called the Caquetá, flows southeast through the department of Cauca and across the border into Brazil, where it joins the Amazon River. Its total length is *ca.* 1,750 m.

Jaques-Dalcroze (*zhāk-dăl-krōz′*), EMILE, composer, born of Swiss parents in Vienna, Austria, July 6, 1865; died in Geneva, Switzerland, July 1, 1950. After studying music in Geneva, he became (1892) professor of harmony at the conservatory there and developed his method of eurhythmics, a system of rhythmic body movements to interpret musical compositions. In 1910, at Hellerau, Saxony, he established the first school to teach his system. Later he founded (1915) the Institut Jaques-Dalcroze at Geneva, and branches were opened in various cities of Europe and the U.S. The system is credited with a distinct influence on modern ballet. Jaques-Dalcroze's musical compositions include the operas "Janie" (1894) and "Sancho Panza" (1897), as well as violin concerti, choral works, music for piano, and chamber music.

Jarnac (*zhär-nàk′*), BATTLE OF, a military engagement between Catholics and Huguenots (March 13, 1569) at the commune of Jarnac, department of Charente, in western France. The Catholics, led by the duke of Anjou (later Henry III), numerically superior, inflicted a decisive defeat on the Huguenots under Louis, prince of Condé, who was slain in the battle.

Jaroslaw (*yä-rō′slăf*), a city in Poland, in Rzeszów region, on the San River, near the Ukrainian border. It is chiefly an agricultural center. Included in Poland in 1382, it was held by Austria from 1772 until after World War I. In World War II it was taken by the Germans in 1941. Population, *ca.* 22,000.

Jarrow (*jăr′ō*), a municipal borough in northern England, on the River Tyne, 275 m. N. of London. An industrial center, it has chemical plants, shipyards, iron foundries, and paper mills. It is the site of a 17th-century monastery which was the home of the Venerable Bede. Population, 1961, 28,752.

Jarves (*jär′vēs*), DEMING, pioneer glass manufacturer, born in 1790; died in Boston, Mass., April 15, 1869. He established a glass factory in Sandwich, Mass., where from 1827 was made the pressed glass known as Sandwich glass. Jarves built his own furnaces, and his factory prospered even against competition from foreign imports. His son, JAMES JACKSON, newspaper publisher, was born in Boston, Mass., Aug. 20, 1818; died in Tarasp, Switzerland, June 28, 1888. He established (1840) and edited the *Polynesian,* the first newspaper published in the Hawaiian Islands. A notable art collector, he sold (1871) his paintings to the Yale Art School and gave (1881) his collection of Venetian glass to the Metropolitan Museum of Art in New York City.

Jarvis (*jär′vĭs*), an island (1 sq. m.) of the Line Islands, a coral group in the South Pacific Ocean. Discovered by a British expedition in 1821, it has been variously known as Bunker, Volunteer, Jervis, and Brook Island and has been claimed by both Great Britain and the U.S. An American company exploited its deposits of guano (1857-79), and in 1889 it was annexed by Great Britain but not occupied. In 1935 the U.S. claimed and colonized the island, without objection from the British. Under the jurisdiction of the U.S. Dept. of the Interior, it is the site of an air and weather station.

Jasmin (*zhàs-măn′*), JACQUES, pseudonym of JACQUES BOÉ, poet, born in Agen, France, March 6, 1798; died near there, Oct. 4, 1864. A Gascon, he was called the last of the troubadours (because he traveled the countryside presenting his work personally), and the Barber Poet (because of his

trade as a barber and wigmaker). A collection of his work was published (1835) under the title *"Papillotes,"* meaning "curl papers."

Jasmine (*jăs'mĭn*) or JESSAMINE, flowering shrubs of the genus *Jasminum*, including *ca.* 100 species. They are native to tropical and subtropical areas of Asia and Europe but are cultivated elsewhere for their fragrant flowers, from which oil of jasmine is prepared. The leaves are simple or compound, the corolla is tubular, the ovary is two-lobed, and the fruit is berrylike. An American species of the genus *Gelsemium* is known as the *yellow jasmine* or *Carolina jessamine;* it is a twining shrub which bears fragrant yellow flowers and is the state flower of South Carolina.

Jason (*jā'sn*), in Greek mythology, leader of the Argonauts (*q.v.*). When his father, Aeson, king of Iolcos, was ousted from his realm, Jason was taken to safety. When he reached manhood, he demanded possession of his kingdom from the usurper, Pelias. Pelias persuaded Jason to undertake a quest for the Golden Fleece, an adventure from which he believed the young man could not return alive. Jason agreed, however, and with a company of 50 of the greatest heroes of Greece set forth in the ship *Argo*. After many adventures they reached the kingdom of Colchis, where the king, Aeëtes, promised to give up the Fleece if Jason would yoke two fire-breathing bulls and sow dragon's teeth in a field. Aphrodite, goddess of love, caused Aeëtes' daughter Medea to fall in love with Jason, and with her magical powers she helped him accomplish the task and to defeat the army of warriors that sprang up from the dragon's teeth. Jason seized the Fleece, and Medea fled with him and the Argonauts. She helped them escape by murdering her brother, and helped Jason revenge himself on Pelias for the murder of his father. Nevertheless, Jason married the daughter of the king of Corinth. In despair and revenge, Medea killed his bride and her own two sons, whereupon Jason took his own life.

Jasper (*jăs'pĕr*), an opaque variety of quartz. Depending on the impurities present, it occurs in various colors, including dark green, reddish brown, and brownish black. Green chalcedony (*q.v.*) is called jasper; this variety spotted with red is called *bloodstone* or *heliotrope*. *Agate jasper* is found in layers with chalcedony. Jasper striped with red and green is called *ribbon jasper*. A semivitrified clay or shale is called *porcelain jasper*.

Jasper, WILLIAM, soldier, born in South Carolina, *ca.* 1750; killed at Savannah, Ga., Oct. 9, 1779. At the beginning of the Revolution he joined the second South Carolina regiment with the rank of sergeant. He distinguished himself at Ft. Moultrie on June 28, 1776; during an attack by the British fleet the colors were shot down, and Jasper braved cannon fire to replace the flag. Later Jasper won further distinction as the leader of a roving squad in an attack on British outposts.

Jaspers (*yäs'pĕrs*), KARL, psychologist and philosopher, born in Oldenburg, Germany, Feb. 23, 1883. An exponent of the existential school of philosophy, Jaspers is the author of numerous books, including *"Psychologie der Weltanschauungen"* (1919), *"Die geistige Situation der Zeit"* (1931; "Man in the Modern Age," 1933), *"Existenzphilosophie"* (1938), *"Die Schuldfrage: ein Beitrag zur deutschen Frage"* (1946; "The Question of German Guilt," 1947), *"Die grossen Philosophen"* (1957), and "The Future of Mankind" (1961).

Jassy (*yäs'ē*) or IASI, a city in northeastern Rumania, capital of Jassy region, *ca.* 200 m. N. of Bucharest. A rail center, it is an important commercial city, manufacturing textiles and food and tobacco products. It is an Orthodox archbishopric and the seat of a university (founded in 1860) and a national theater. Jassy was burned successively by the Tatars (1513), the Turks (1538), and the Russians (1686). It became capital of Moldavia in 1565 and was capital of Rumania before the government was moved to Bucharest in 1861 and again, briefly, in World War I. During World War II the city was taken by the Russians in 1944. Population, 1958 (est.), 121,000.

Jastrow (*jăs'trō*), JOSEPH, psychologist, born in Warsaw, Poland, Jan. 30, 1863; died in Stockbridge, Mass., Jan. 8, 1944. He was the son of Marcus Jastrow (1828-1903), rabbi, lexicographer, and Polish patriot, who came to the U.S. in 1866. Joseph was educated at the Univ. of Pennsylvania and became a fellow in psychology at Johns Hopkins Univ. He taught psychology at the Univ. of Wisconsin (1888-1927) and lectured (1927-33) at the New School for Social Research, New York City. His writings include "Time Relations of Mental Phenomena" (1890), "The Subconscious" (1906), "Character and Temperament" (1915), "Piloting Your Life" (1930), "Effective Thinking" (1931), "The Betrayal of Intelligence" (1938), and many articles such as the series "Keeping Mentally Fit" (1928-32).

Jastrow, MORRIS, Orientalist and educator, born in Warsaw, Poland, Aug. 13, 1861; died in Jenkintown, Pa., June 22, 1921. The brother of Joseph Jastrow (*q.v.*), he was graduated from the Univ. of Pennsylvania in 1881 and studied Semitic languages and Near Eastern religions in Leipzig and Paris. Returning to the Univ. of Pennsylvania, he was professor (from 1892) and librarian (from 1898). He was a special editor of "Webster's New International Dictionary" (1910), and the author of "The Study of Religion" (1901), "The Book of Job" (1920), and "The Song of Songs" (1921).

Courtesy Republic of Indonesia

JAVANESE WATERFRONT

Native fishing craft at anchor in the harbor of Soerabaja, Indonesia

Jataka (*jä'tạ-kạ*), a term for 547 stories in the Pali language which form a part of the Buddhist sacred literature. The stories are in the form of legends, parables, and fables. After the death of Buddha, the stories were sanctified by identifying a character in each story as Buddha in one of his previous lives on earth (see *Transmigration*). The stories resemble those of the beast fables in *Panchatantra,* written in the Sanskrit. The jatakas and *Panchatantra* probably influenced Western stories and tales such as Aesop's fables.

Jats (*jäts*), an ethnic group of India, believed to have descended from Saka or Scythians who invaded India during the first centuries before and after the birth of Christ. Most of the Jats are Hindus of the highest caste, and some are converts to the Moslem and Sikh religions. Most Jats reside in the Punjab region and are engaged in agriculture.

Jaundice (*jạn'dĭs*) or ICTERUS, a disease of the gallbladder, liver, or the blood, resulting from obstructive, toxic, or hemolytic causes. Excessive amounts of bile pigments present in the blood color the skin, mucous membranes, tissues, and body fluids. The skin and eyes appear yellow.

Jaurès (*zhô-rĕs'*), JEAN LÉON, politician, born in Castres, France, Sept. 3, 1859; assassinated in Paris, July 31, 1914. Jaurès served in the chamber of deputies in 1885-89; 1893-98; and 1902-14. He backed the case of Dreyfus (*q.v.*) in his newspaper *La Pétite République.* He was a leader of the French Socialist party and in 1904 founded, with Aristide Briand, *L'Humanité,* which was the socialist organ until 1920. He edited the newspaper until his death and also directed the writing of a history of France, prepared from the Socialist point of view. He saw the coming of World War I and sought to avert it by contacting other European Socialist groups to form a movement for peace. Shortly before the outbreak of hostilities, he was assassinated by a fanatical nationalist.

Java (*jä'vạ*), the principal island of the Republic of Indonesia, about 220 m. s. of Borneo. It is bounded on the N. by the Java Sea, on the E. by Bali Strait, on the S. by the Indian Ocean, and on the W. by Sunda Strait (separating it from Sumatra). Its length from east to west is *ca.* 650 m.; its breadth, from *ca.* 40 to *ca.* 130 m.; and its area, *ca.* 50,000 sq. m. The surface is rugged, being characterized by rapid streams and a volcanic mountain range running in an east-west direction. It has several active volcanoes, of which the highest are Mts. Semeroe, or Semeru (12,060 ft.) and Slamet (11,246 ft.). The rivers are short and torrential and are used for irrigation. In the western part is the highland region, and along the irregular northern coast are wide fertile plains. The climate along the coast is warm and humid; inland it is less humid. Heavy rainfall occurs from December to March. The island has lush tropical vegetation and dense forests. Among the native trees are teak, ebony, sandalwood, and ironwood. Bamboo, rattan, flowering shrubs, and vines are seen in abundance. The tiger, wild hog, rhinoceros, panther, deer, several species of monkey, large bats, snakes, and many varieties of birds are indigenous.

The natural resources of the island include gold, sulfur, phosphate, and petroleum. There are many rubber plantations. Tea, coffee, tobacco, and cinchona (a tree whose bark yields quinine) are grown in the western highlands, and sugar cane and kapok in the east. There are rice fields on the mountain slopes, and peanuts and cassava grow in other sections of the island. The principal exports are rubber, sugar, teak, and quinine, of which Java produces most of the world's supply. Manufactures include textiles, leather, metal work, drugs, chemicals, and glass. Particularly well known are the silver craft and batik work. Cable lines connect Java with the continents, and there are railroads and a highway system.

The colonization of Java, whose population belongs largely to the Malayan race and to the

Courtesy Canadian Pacific Steamships

JAVA. BARABUDUR TEMPLE IN DJOKJOKAITO

Architecture, the principal field of Javanese art, excelled in complex temple structures. The manifold terraces, culminating in the shrine which houses an image of Buddha or Bodhisattvas, are typical of Javanese style. Sculptures and reliefs, frequently illustrating Sanskrit texts, enrich these colossal square galleries. With the victory of Islam over Buddhism at the beginning of the 16th century, the glory of Javanese architecture and architectural sculpture, which had flourished from the end of the 7th century, came to an end

Moslem faith, was begun in the 7th century by the Hindus. By the 14th century the Hindu-Javanese state of Madjapahit (founded 1293) had expanded to include almost all of the Malay Archipelago. It was conquered by the Mohammedans, who established the Moslem state of Mataram in the 16th century. The island came under control of the Portuguese in 1511. The Dutch arrived in 1596 and the English in 1600. The newly established Dutch East India Co. easily expelled the Portuguese, and, after hostilities (1610-23), the English were forced out. A dominant power in the area, the Dutch East India Co. was terminated in 1795 when the Dutch government took over its holdings, known thereafter as the Dutch East Indies. Occupied (1811-16) by the British during the Napoleonic Wars, Java remained a Dutch colony until World War II. During the Japanese occupation (1942-45), Javanese nationalists were active in the movement for independence, and in 1945 they joined other East Indian nationalists in proclaiming the Republic of Indonesia. After four years of war, Indonesia was granted sovereignty. Dutch rule developed material resources, established commerce, and founded institutions of higher learning (there are six state universities in Java). In addition to Jakarta, the capital of Indonesia, other cities are Jogjakarta, Semarang, and Bandoeng. Population (including Madura, *q.v.*), 1959 (est.), 58,200,000.

Java Man. See *Pithecanthropus Erectus.*

Java Sea, a body of water of the Pacific Ocean, between Borneo on the north, Celebes on the east, Java on the south, and Sumatra on the west, at 105°-120° E. long. and 5° S. lat. It is about 600 m. long, east to west, and about 200 m. wide, north to south. A decisive sea battle of World War II was fought here, in February 1942, when a united Dutch, Australian, and U.S. fleet met defeat at the hands of the Japanese, clearing the way for Japanese domination of the area until 1945. See also *Indonesia.*

Javelin (*jăv'lĭn*), a short spear used in ancient warfare by both cavalry and infantry. The Roman *pilum,* a type of javelin, which was either thrown by hand or used in thrusting, was a shaft about 4 ft. long, with a barbed iron head of about half that length. To the present day many savage tribes throw lightweight spears, both in warfare and in hunting. Javelin-throwing is also a sport; it is included in the Olympic Games.

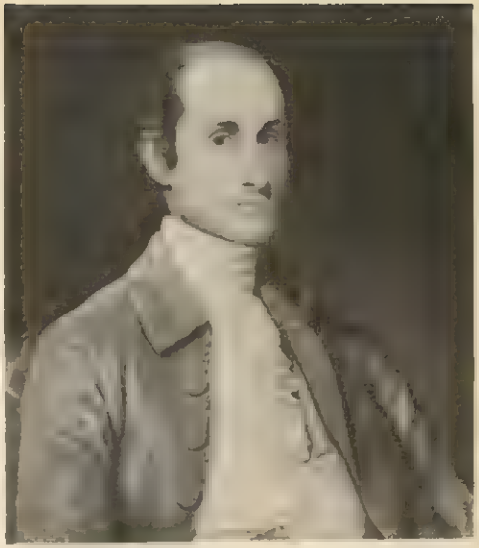
Jay (*jā*), a bird of the crow family. Jays inhabit North and South America and the temperate regions of Eurasia, differing from the crows by being considerably smaller and usually by having a colorful plumage with some shade of blue. The Canada jay is all gray and, unlike other jays, is a friendly and confiding bird. It inhabits the northern coniferous forests. The other jays are very noisy and aggressive and are typified by the blue jay, a handsome ruffian with a blue, lavender, and white plumage and a crest. Other American jays, such as the green jay and scrub jay, have no crests. The European jay is the most widely distributed of all jays and is reddish brown in color with a bright blue patch on the wing. Jays are omnivorous, but their food consists chiefly of seeds and nuts; they are pirates

Amer an Indian—Mongoloid Race

Native Australian—Australoid Race

and often rob the nests of small song-birds of their eggs or even of their young.

Jay, JOHN, statesman and jurist, born in New York City, Dec. 12, 1745; died in Bedford, N.Y., May 17, 1829. He was graduated from Columbia Univ. (then King's Coll.) in 1764 and was admitted to the bar in 1768. Entering public life in 1773 as secretary of a royal commission to settle a New York-New Jersey boundary dispute, he became a member of the New York Committee of Correspondence during the Revolution and of the first and second Continental Congresses (1774-76). A delegate to the New York state constitutional convention in 1777, he was chiefly responsible for the first state constitution. In 1778 he was elected president of the Continental Congress; he served until 1779, when he went to Spain to obtain recognition and assistance, but he succeeded in securing only a small loan. In 1782-83 he was associated with Benjamin Franklin and John Adams in negotiating the peace treaty with England. From 1784 until 1790, he acted as secretary of foreign affairs. After the Constitution was adopted in 1787, he joined Alexander Hamilton and James Madison in writing *"The Federalist"* (*q.v.*) essays in support of its ratification. As the first Chief Justice of the U.S., he helped to form procedures of the Supreme Court and presided during the case of Chisholm *vs.* Georgia, involving the question of whether a state could be sued by a citizen of another. Jay's decision that such a suit was constitutional alarmed the states and brought quick passage of the 11th Amendment to the Constitution. Jay's most notable task, however, was the treaty, known by his name, which he negotiated with England in 1794. With war threatening between England and America, Washington sent Jay to arrange a settlement of issues that might ease the tension. The terms of the treaty, negotiated with Lord Grenville of England, were as much the responsibility of Hamilton as of Jay, however. They included free trade between the U.S. and England; the evacuation of British troops from the Northwest Territory; and settlement by mixed commission of boundary disputes between the U.S. and Canada, of British debt claims against U.S. citizens, and of spoliation claims arising from the British violation of U.S. neutrality. The treaty was ratified by the Senate after protracted debate but was generally unpopular in the U.S. because it made no reference to British impressment of U.S. seamen and to restricted trade with the West Indies. The treaty was later generally regarded as a necessary evil, but Jay was blamed for his part in it, and the Federalist party was consequently weakened. Jay's last public office was the governorship of New York in 1795-1801, after which he retired to his farm in Bedford, N.Y.



Courtesy N. Y. Historical Society

JOHN JAY
Painting by Joseph Wright (1756-93)

Jayhawker (*jā'hąk-ēr*), a name which originated in Kansas at the time of the contest over slavery. The name was derived from the jay hawk, a vicious bird of prey, to which the irregular and freebooting soldiers who were first called jayhawkers were likened. Later the term was used throughout the states of the West and South during the Civil War. The name is still a nickname for a Kansan.

Jazz (*jăz*), a kind of American music (*q.v.*) developed chiefly by Negroes and consisting generally of variations, usually syncopated and often polyphonic, on a theme in common (4/4) time. Much of it is improvised. In its traditional or classic form, achieved in New Orleans about the turn of the century, it is a creative synthesis of various musical sources, including blues, spirituals, hymns, marches, and Creole songs.

A traditional jazz band consists typically of one or (less frequently) two cornets or trumpets, a clarinet, a trombone, and a "rhythm section" composed of two or more of the following: piano, drums, banjo or guitar, and double bass or tuba. Among the Negroes born in New Orleans, La., who became famous as performers of traditional jazz were Joseph "King" Oliver (1885-1938), cornetist; Ferdinand Joseph La Menthe ("Jelly Roll") Morton (1885-1941), pianist; Sidney Bechet (1897-1959), clarinetist and soprano saxophonist; and Daniel Louis "Satchmo" Armstrong (1900-), trumpeter.

The first recordings of traditional jazz were made in 1917 by the Original Dixieland Jazz Band, a group of white musicians from New Orleans. The term *Dixieland* is employed by some to denote traditional jazz in general and

Wide World Photo

JAZZ GREATS

Clarinetist Benny Goodman and drummer Gene Krupa

by others to denote only the type of music associated with the Original Dixieland Jazz Band and other white traditional-jazz bands. This music is different in subtle respects from that of the New Orleans Negro bands.

Another type of jazz, called *swing*, enjoyed great popularity from 1935 to 1941. It was generally played by "big bands" of about 15 men; the most celebrated were those of the clarinetist Benjamin David ("Benny") Goodman (1909-) and the pianist William ("Count") Basie (1904-), respectively. In this relatively bland music, greater reliance was placed upon rhythm and less upon contrapuntal invention than in traditional jazz.

Markedly different from both traditional jazz and swing was *bop*, which was introduced in the early 1940's. Its most famous performers were the alto saxophonist Charles ("Yardbird" or "Bird") Parker (1920-55) and the trumpeter John Birks ("Dizzy") Gillespie (1917-). Bop was characterized by modern or progressive harmonies, in contrast with the simple harmonies of traditional jazz. It expressed in many cases a frenzy or desperation alien to the earthy good humor of traditional jazz.

The 1940's witnessed also a revival of traditional jazz, which had been in eclipse since about 1929. Some of the old New Orleans performers, notably the trumpeter William Geary ("Bunk") Johnson (1879-1949), were rediscovered. Prominent among the band-leader musicians carrying on the tradition through the 1950's were the guitarist Edwin ("Eddie") Condon (1904-), the trombonist Melvin E. ("Turk") Murphy (1915-), and the New Orleans drummer Paul Barbarin (1901-).

Nontraditional modern or post-bop jazz comprises diverse trends. Some of it is strongly influenced by classical and modern European music. Thus, two men thoroughly trained in the European musical tradition, the pianists Dave W. Brubeck (1920-) and John Aaron Lewis (1920-), are the leaders of popular modern-jazz "combinations," both of them quartets. Although instrumentation varies from group to group, the make-up of these two combinations is more or less typical. Both include piano, drums, and double bass. The fourth instrument in the Brubeck Quartet is an alto saxophone; in Lewis's Modern Jazz Quartet it is a vibraphone. This "sophisticated" music may be contrasted with another jazz phenomenon of the 1950's—rock-and-roll (originally called rhythm-and-blues), a simple, highly rhythmic, jazz popular almost exclusively with teen-agers.

Jeanneret (*zhän-rĕ'*), CHARLES EDWARD. See *Le Corbusier*.

Jeannette (*jē-nĕt'*), a city in Westmoreland County, Pennsylvania, *ca.* 25 m. S.E. of Pittsburgh, on the Pennsylvania R.R. The surrounding country is agricultural, with rich coal deposits. Manufactures include glass, foundry products, power equipment, and plastics; brewing is also an important industry. Jeannette was founded in 1888 and incorporated as a borough in 1889 and as a city in 1937. Population, 1950, 16,172.

Jeans (*jēnz*), SIR JAMES HOPWOOD, physicist, astronomer, mathematician, and author, born in London, England, Sept. 11, 1877; died in Dorking, Surrey, Sept. 16, 1946. Graduated from Cambridge Univ. with honors, he taught applied mathematics at Princeton Univ. (1905-09) and Cambridge (1910-12); he was a research associate at Mt. Wilson Observatory, Calif. (1923-44). He did important research (primarily mathematical) on radiation and the kinetic theory of gases and on theories regarding the effects of gravity on stellar motion and the formation and nature of various kinds of stars. With Harold Jeffreys, he advanced a theory on the origin of the solar system. He produced many significant technical works but is best known generally for his books for laymen on scientific subjects, "The Universe Around Us" (1929), "The Mysterious Universe" (1930), "The Stars in Their Courses" (1931), and "Through Space and Time" (1934).

Jeddah (*jĕd'dą*). See JIDDA.

Jeep (*jēp*), the popular name (probably derived from the initials *G.P.*, abbreviation for "general purpose") for a light combat and utility vehicle developed for the U.S. Army during World War II. The capacity was one-quarter ton; length, 11 ft., width, 5 ft., height above road, 3 ft., and weight, 2,200 lb. Its sturdiness, plus its four-wheel drive, gave it great versatility. Manufacture was divided between Willys-Overland Motors, Inc., and the Ford Motor Co.; Willys produced a total of 361,000 units and after the

war continued to use the basic jeep pattern for a light passenger and utility car.

Jefferies (*jĕf'riz*), RICHARD, naturalist and author, born near Swindon, England, Nov. 6, 1848; died in Goring, Aug. 14, 1887. After leaving school at 15 and failing in attempts to travel to Russia or America, he took a job with a newspaper in his home community and wrote a number of unsuccessful plays and novels. A new phase of his career began in 1872 with the publication in the London *Times* of his letter on "The Wiltshire Labourer." The letter, which attracted wide attention, was only the first of numerous portrayals of rural life which he successfully published in books and magazines. His work, distinguished by his acute observation and understanding of country life, included "The Gamekeeper at Home" (1878), "Wood Magic" (1881), "Life of the Fields" (1884), and his autobiography, "The Story of My Heart" (1883).

Jeffers (*jĕf'ĕrz*), (JOHN) ROBINSON, poet, born in Pittsburgh, Pa., Jan. 10, 1887; died in Carmel, Calif., Jan. 20, 1962. He was graduated (1905) from Occidental Coll. and did further studies in English, forestry, and medicine. In 1914 he received a legacy which freed him from financial worries, and with his own hands he built a stone house on Pt. Sur, Carmel, Calif., and the stone tower in which he wrote. The doom-haunted vision of man regarding himself rather than nature, revealed in his work, was sometimes characterized as negativistic. His works include the adaptation of Euripides' "Medea," which was made famous by the performance (1947) of Judith Anderson (*q.v.*). His other works include "Flagons and Apples" (1912), "Californians" (1916), "Loving Shepherdess" (1955), "Themes in My Poems" (1956), and also the plays "Tower beyond Tragedy" and "Dear Judas." He became a fellow of the Acad. of American Poets in 1958.

Jefferson (*jĕf'ĕr-s'n*), JOSEPH, actor, born in Philadelphia, Pa., Feb. 20, 1829; died in Palm Beach, Fla., April 23, 1905. Descended from a line of actors, he made his debut at the age of four in the act of Thomas D. ("Jim Crow") Rice, a famous interpreter of Negro songs and dances. His childhood was spent touring on the Western frontier, and he received no formal schooling. Returning East at the age of 20, he played stock and in 1856 went to Europe for a few months of study. After his return, he joined Laura Keene's company in New York City and won recognition for his performance in "Our American Cousin" by Tom Taylor. He is most famous for his title role in "Rip Van Winkle," a dramatization of Washington Irving's story, which he persuaded Dion Boucicault (*q.v.*) to write. The play, which opened at the Adelphi Theater in London in 1865, was brought to New York in 1866 and rapidly became an institution throughout the U.S. The principal attraction of the play, Jefferson shelved most of his other roles in favor of *Rip*, until 1880; he then created another famous role for himself with his characterization of *Bob Acres* in "The Rivals" by Richard Sheridan.

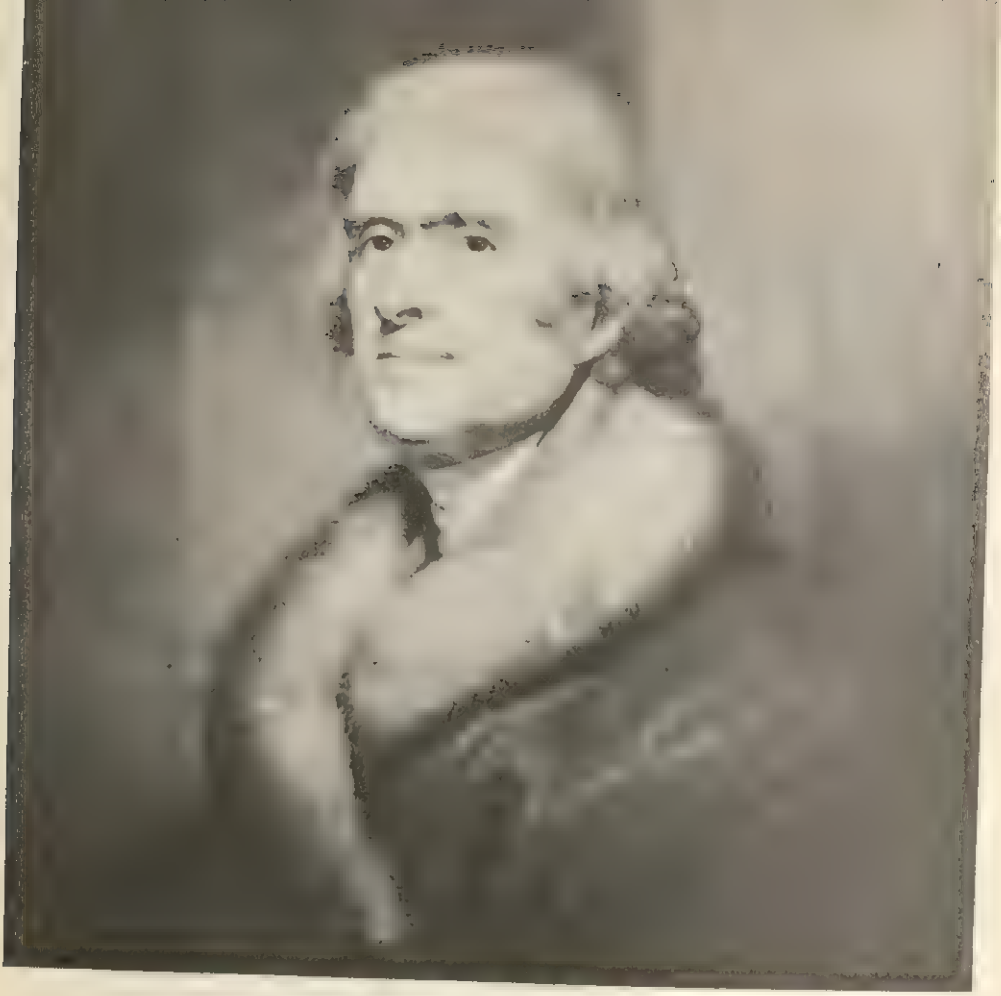
Jefferson, STATE OF, the name suggested in 1859 for the territory which became the State of Colorado (1876). The residents were opposed to joining the Union and elected their own governor, Robert W. Steele, who resigned upon the formation of Colorado Territory (1861) with the boundaries of the present state.

Jefferson, THOMAS, third President of the U.S., inventor, architect, botanist, ethnologist, writer, and statesman, born at Shadwell, Goochland County, Va., April 13, 1743; died at Monticello, July 4, 1826. His father had prospered on the Virginia frontier; his mother, Jane Randolph, came of Virginia's aristocracy. He was educated at William and Mary Coll. and studied law under George Wythe (*q.v.*). By 1769, Jefferson had become a member of the Virginia House of Burgesses, where he actively opposed British colonial policy. His marriage to the widowed Martha Skelton in 1772 did not reduce his political activities. Though considered too radical for the First Continental Congress, he was sent to the Second in 1775. His known views and his literary skill prompted his appointment to the committee established to draft a Declaration of Independence. Although John Adams and Benjamin Franklin (*qq.v.*) made verbal emendations, and the Congress made important amendments and deletions, the Declaration remains Jefferson's famous contribution to the literature of freedom.

The following three years Jefferson spent in the Virginia legislature, where he succeeded in ending entail and primogeniture (the legal bases for landed aristocracy) and in revising the code of laws. He served as governor in 1780-81, during which time the British invaded Virginia.

In Congress in 1784, Jefferson drafted a report on a monetary system which gave the U.S. its decimal currency. Had his report on the organization of a government for the western lands ceded by the states been accepted in Congress instead of being rejected by one vote, slavery would have been excluded from U.S. territories, thus perhaps evading the issues which later brought on the Civil War. This report did, however, become the basis for the Ordinance of 1787, which abolished slavery in the Northwest Territory.

After four years of diplomatic service as minister to France, Jefferson was appointed Secretary of State in 1789. Although he helped Alexander Hamilton (*q.v.*) carry through his plan to have the Federal government assume the Revolutionary War debts of the states, he soon became the leader of the opposition to strong central government in the interests of a moneyed upper class.



Courtesy N. Y. Historical Society

THOMAS JEFFERSON

Painting by Rembrandt Peale (1778-1860)

His personal influence helped build that opposition into a party, the Democratic-Republican, which made him Vice-President in 1796. In 1801, when an ambiguity in the phrasing of the Constitution left choice of a President to the House of Representatives, Jefferson succeeded to the White House against Aaron Burr (*q.v.*). In this situation, in which both the candidates had received the same number of electoral votes, Hamilton refused to carry Federalist intrigue to its logical conclusion if that conclusion meant making Aaron Burr the President.

In 1802, when Spain closed the Mississippi to American commerce before retroceding Louisiana to France, Jefferson attempted to purchase New Orleans. Napoleon, defeated in Haiti and needing money for his approaching war with England, offered to sell the entire territory. Although it meant broad construction of the Constitution and an increase in the public debt, Jefferson accepted the proposal. Faced by European war, Jefferson attempted to defend American rights by economic coercion, but his Embargo Act of 1807 proved more damaging to American than to British commerce and had to be abandoned in 1809.

When Jefferson left the Presidency in 1809, his foreign policy stood discredited, for his own party had yielded on the embargo and the western "War Hawks" scorned his readiness to make any sacrifice to maintain peace. Furthermore, the Federalists had made John Marshall Chief Justice, thus assuring an essentially Hamiltonian interpretation of the Constitution, an interpretation that was to last, on the whole, for well over a century. Jefferson, on the other hand, had doubled the nation's territory without bloodshed; and, although he could not get Aaron Burr convicted of treason in 1806, he had nevertheless discredited that variety of political adventurism.

During the subsequent years of his retirement at Monticello (*q.v.*), Jefferson advised his successors in the Presidency, continued his interest in education, and tried, unsuccessfully, to cope with his own mounting debts. Though he never suc-

ceeded in persuading Virginia legislatures to establish a system of public schools, he was able to direct his executors to write his epitaph: Author of the Declaration of Independence and the Virginia Statute of Religious Freedom and Founder of the University of Virginia.

Jefferson City, capital city of Missouri and county seat of Cole County; on the south bank of the Missouri River, *ca.* 125 m. w. of St. Louis, and on the Missouri Pacific and the Missouri, Kansas & Texas R.R.'s. It is the trading center and distributing point of an extensive agricultural section. Among the noteworthy buildings are the capitol building with its famous murals and paintings, Lincoln Univ. (a four-year college for Negroes), the supreme court building, the executive mansion, the state office building, the state penitentiary, the public library, the hospital, and 17 churches. The manufactures include shoes, clothing, brooms, bricks, furniture, machinery, and paper, grain, and dairy products. The place was laid out in 1822 and incorporated in 1825. Population, 1940, 24,268; in 1950, 25,099.

Jeffersonville (*jĕf'ẽr-sŭn-vĭl*), county seat of Clark County, Indiana, on the Ohio River, opposite Louisville, Ky. It is on the Pennsylvania, the Big Four, and the Baltimore & Ohio R.R.'s. The chief buildings include the Memorial Hospital and the U.S. Quartermaster depot. Among the manufacturing establishments are machine shops, foundries, shipyards, railroad-car works, oil refineries, and flour and lumber mills. The city trades in manufactures, coal, and produce. Jeffersonville was incorporated in 1823. Population, 1940, 11,493; in 1950, 14,685.

Jeffreys (*jĕf'frĭz*), GEORGE, FIRST BARON, lord chancellor of England, born in Acton, Wales, in 1648; died April 19, 1689. He entered Westminster school at 16, was admitted to the bar, and in 1683 became chief justice of the king's bench. His judicial life was marked by infamy and cruelty. To secure the special favor of James II, he formulated his decisions in a way to please the king and without respecting justice or legal limitations. Among those suffering by his injustice were Algernon Sydney, Titus Oates, Richard Baxter, and the victims of Monmouth's unsuccessful rebellion. Jeffreys' decision in the last instance resulted in the execution of 320 men, the transportation of 841, and the cruel and unusual punishment of many others. His boast that he had hanged more traitors than all his predecessors induced James II to make him lord chancelor. After James was forced to abdicate, Jeffreys was cast into the Tower, where he died four months later.

Jehol (*rē'hō*), a province of China, N.E. of Peiping and the Great Wall of China. The capital of the province is Chengteh (population, *ca.* 47,000), also known as Jehol. Area of province, 74,297 sq. m. Population, 1947, 2,185,000.

Jehoram (*jē-hō'rąm*) or JORAM, name of two men of the Old Testament: a king of Israel and a king of Judah, both 9th century B.C.

Jehoshaphat (*jē-hŏsh'ą-făt*), the son of Asa and the fourth king of Judah. The year of his birth is generally fixed at 950 B.C., and his rule is assigned to the period between the years 915 and 890 B.C. His name means "Jehovah's judgment." He abolished idol worship and instead established the worship of Jehovah. Jehoram, his son, who was afterward killed by Jehu in the Battle of Ramoth-Gilead, reigned jointly with Jehoshaphat during his later years.

Jehovah (*jē-hō'vą*), the most sacred of the names applied to the Supreme Being in the Old Testament, where it is used especially to designate the God of the Jewish people. Its meaning is explained in Exodus as "I am that I am," thus predicating self-existence in a sense that it cannot be applied to any other being. To the Jews the meaning implied is the personality of the Creator and Ruler of the universe, their Theocratic Guide, the First and the Last, and the Being above all. The name is of Phoenician origin and was used in a limited sense among the Israelites up to the time of Samuel, when its use spread rapidly. As a name it was deemed so holy by the Jews that they were guarded in allowing it to escape their lips, and therefore took means intentionally to mispronounce it or apply less sacred names, such as *Adanoi,* which signifies Lord, and *Elohim,* which means God.

Jehovah's Witnesses (*jē-hō'vąz wĭt'nĕ-sęz*), a religious society founded in 1872 by Charles Taze Russell (called "Pastor" Russell), of Pittsburgh, named the International Bible Students Assn. in 1910-31. Witnesses maintain that Christ returned invisibly in 1914. Especially from that time on, Witnesses accepted the commission to warn the peoples of the world of the final battle against all evil forces (Armageddon, *q.v.*), which would take place in the generation then born. This period, in turn, would be followed by Christ's 1,000-year reign over the earth (the Millenium, *q.v.*).

Witnesses recognize the Bible as "God's word of truth" and follow its commandments. Neutral in political affairs, they do not vote, are conscientious objectors, and place their religious principles ahead of the state's authority when the two conflict.

Upon Russell's death in 1916, leadership passed to Joseph Franklin Rutherford (called "Judge" Rutherford). He adopted the group's present name, its members having been previously referred to also as Russellites.

Nathan H. Knorr became president (1942) of the Watch Tower Bible and Tract Society,

organized in 1884, the group's legal agency.

The group, which is undenominational, has no paid clergy—each Witness being considered a minister—and makes its tenets known through its literature, notably *The Watchtower*, a semimonthly. Witnesses, numbering 715,901 in 1957, are represented throughout the world, with international headquarters in Brooklyn, N.Y.

Jehu (*je'hu*), the 11th king and founder of the fourth dynasty of Israel. He commanded the Israelite army under Jehoram, son of Ahab, stationed at Ramoth-Gilead. Here, an emissary of Elisha, the prophet, anointed Jehu as king of Israel and announced that the dynasty of Ahab should come to an end. Jehu immediately killed Jehoram. Subsequently he had Ahab's children and the brothers of Ahaziah, king of Judah, killed and had the wife of Ahab, Jezebel, thrown from the palace walls and killed. King Ahaziah and all the priests of Baal were executed on the orders of Jehu, and Jehovah's worship was reestablished. Jehu was noted for a violent, reckless personality. His reign and the incidents recounted above are found in II Kings 9-10.

Jekyll and Hyde (*je'kĭl and hīd*), two contrasting personalities embodied in one person, as exemplified in the novel "The Strange Case of Dr. Jekyll and Mr. Hyde" (1886) by Robert Louis Stevenson (*q.v.*). Good is represented by Dr. Jekyll, evil by Mr. Hyde, into whom the former can transform himself at will by means of a drug.

Jellicoe (*jĕl'ĭ-kō*), JOHN RUSHWORTH, FIRST EARL, naval commander, born in Southampton, England, Dec. 5, 1859; died Nov. 20, 1935. Entering the Royal Navy in 1872, he participated in the expedition which went to the relief of the legations at Peking (Peiping) during the Boxer Rebellion in 1900, and in 1907 was promoted to the rank of rear admiral. During World War I he commanded (1914-16) the grand fleet, directing the British in the great naval battle of Jutland (May 31, 1916). He was first lord of the admiralty (1916-17) and chief of naval staff (1917), and during this period he greatly reduced the effectiveness of German submarine operations. He was governor general of New Zealand from 1920 to 1924, when he retired.

Jelly (*jĕl'ĭ*), a food substance composed of fruit juice boiled with sugar so that it forms an elastic consistency. To achieve this elasticity, it is necessary to use fruits with sufficient pectin and acid, such as apples, crabapples, quinces, currants, grapes, and plums. The liquid is pressed from the fruit and afterward boiled with sugar to form the proper consistency when cold. Slightly under-ripe fruits are richer in acid and pectin than those which are fully ripe. A commercial pectin or gelatin may be added to fruits, such as cherries, peaches, raspberries, or strawberries, which have a low pectin content. The pectin may also be secured by adding another fruit that is rich in pectin. Commercial preparation of jelly is a sizable industry; however, many homemakers still make their own.

Jellyfish (*jĕl'ĭ-fĭsh*), a bell-shaped marine animal, belonging to the group known as *Coelenterata*. It is called jellyfish because, when lying on the sand, it looks like a mass of jelly. In the water the jellyfish looks very beautiful, moving with great rapidity by alternately contracting and expanding its semitransparent body. Many of the jellyfishes show a phosphorescent light at night. They live on crustaceans and small fish, which they seize with their long, stinging tentacles. Four orders and many species have been described. They are devoured in immense numbers by the right whales and other sea animals.

Jemappes (*zhē-màp'*), a town in the province of Hainaut, Belgium, noted chiefly as the scene of the Battle of Jemappes. This battle was fought on Nov. 6, 1792, between the French under Dumouriez and the Austrians under the Duke of Saxe-Teschen. The French army of 46,000 men consisted largely of inexperienced volunteers and was sent in three columns against the Austrian army of 26,000 veterans. At first the French were beaten back with great losses, but they rallied, and the engagement resulted in an Austrian defeat. The town is linked by rail with other centers, and has manufactures of various kinds. Population, *ca.* 13,500.

Jena (*yā'nä*), a city in Thuringia, Germany, on the Saale River, about 12 m. S.E. of Weimar. It is famous for the Univ. of Jena, which was planned by John Frederick of Saxony in 1547, and was opened for instruction in 1558. Among the eminent men associated with the institution were Fichte, Hegel, Schelling, Schlegel, and Schiller (*qq.v.*). The city is noted also for its optical industry. Following World War II, it was occupied by Soviet troops. Population, *ca.* 55,000.

Jena, BATTLES OF, two important engagements between the Prussians and the French, which occurred on Oct. 14, 1806, one near Auerstedt, Germany, the other near Jena. In the former battle Gen. Davout commanded 30,000 Frenchmen, and the Duke of Brunswick led 48,000 Prussians; in the latter Napoleon I commanded 90,000 Frenchmen, and Prince Hohenlohe had the superior command of 65,000 Germans. The French were victorious in both battles, thereby crippling Prussian power considerably.

Jenkins (*jĕn'kĭnz*), JOHN EDWARD (or EDWARD), author, born in Bangalore, India, July 28, 1838; died June 4, 1910. He studied at McGill Univ., Montreal, and at the Univ. of Pennsylvania, and subsequently took a course in law at Lincoln's Inn, London. In 1864, he was admitted to the bar and began a successful colonial practice, serving as counsel for sev-

eral South African commissions. He was the first agent-general for Canada, 1874-76, later served as member of the royal commission on copyrights, and in 1874-80 was a Liberal member in Parliament for Dundee and was re-elected subsequently. Besides contributing to periodical literature, he published many essays and novels. His published works include "Ginx's Baby, His Birth and Misfortunes," "A Secret of Two Lives," "A Study of West Indian Life," "A Paladin of Finance," and "A Week of Passion."

Jenks (*jĕngks*), JEREMIAH WHIPPLE, teacher and author, born in St. Clair, Mich., Sept. 2, 1856; died at New York City, Aug. 24, 1929. He was graduated from the Univ. of Michigan, studied for several years in Germany, and became professor of languages in Mt. Morris Coll. Later he held similar positions in Knox Coll. and Indiana Univ., and in 1891 was made professor of politics and political economy at Cornell Univ. In 1902 he was appointed a special commissioner to investigate questions of labor, currency, and police, and the following year was invited to Mexico to advise the minister of finance concerning the currency system of that country. At various times he visited other countries to study political and economic questions or to serve in an advisory capacity. His publications include "The Trust Problem."

Jenner (*jĕn'nĕr*), EDWARD, physician, known as the father of vaccination, born in Berkeley, Gloucestershire, England, May 17, 1749; died there, Jan. 26, 1823. His first training was secured under an apprenticeship near Bristol; later he studied at London under John Hunter, and subsequently practiced medicine in Gloucestershire. The observation that dairymaids who had cowpox did not contract smallpox led him to study and apply the theory of preventing smallpox by vaccination with cowpox in several cases. His success resulted in the introduction of vaccination in 1796. On May 14, 1796, James Phipps, a small boy, was vaccinated successfully, and was the first subject on whom the experiment proved effective. Soon various physicians of Europe made similar experiments with more or less success, and vaccination came into general use. Jenner was elected an honorary member of many learned societies, and Parliament voted him grants amounting to $150,000.

JENNER PERFORMING HIS FIRST VACCINATION
The vaccine was taken from a dairymaid (*right*) suffering from cowpox
Courtesy Bettmann Archive, N. Y

JOHANNES V. JENSEN

Jensen (*yĕn'sĕn*), JOHANNES VILHELM, writer, born in Farsö, Denmark, Jan. 20, 1873; died in Copenhagen, Nov. 25, 1950. Jensen began his career as a writer in 1907. He wrote numerous novels, as well as poems and short stories, and in 1944 was awarded the Nobel Prize for literature. Among his better-known works are *"Madame d'Ora"* (1904), "The Long Journey" (1909-20, Eng. trans. 1922-24) a six-novel epic of human evolution, *"Digte"* (1931), "The Fall of the King" (1933), "Gudrun" (1936), *"Paaskebadet; Digte"* (1937), "Fra Fristaterne" (1939), and *"Nordvejen"* (1939).

Jeopardy (*jĕp'ẽr-dĭ*), legal term referring to the peril incurred by a criminal process. General use of the term stems from the Fifth Amendment to the U.S. Constitution in which it is stated that no person shall twice be put in jeopardy of life or limb for the same criminal offense. Thus if a person is tried for a criminal offense and found not guilty, that person cannot be tried for the same offense again, unless it can be proved that the first

trial was in error (*i.e.*, either the jury improperly empaneled, a proper point of law was ignored, or the like). Double jeopardy applies only to criminal suits and excludes all civil proceedings.

Jephthah (*jĕf'thȧ*), a Hebrew judge, son of Gilead, distinguished as a military leader. He defeated the Ammonites in a long campaign and for his valor was chosen ruler of Israel, being the ninth judge. Previously he had made a vow that if God would give him victory over the Ammonites, he would offer as a sacrifice to Him, in a burnt offering, the first thing that came to meet him out of his house. His only child, a daughter, met him, whom he sacrificed. Some commentators maintain that she was simply set apart as a virgin in a tabernacle. Jephthah ruled six years. A Latin drama, a poem by Tennyson, and Handel's last oratorio were suggested by the story of the sacrifice of Jephthah's daughter.

Jepson (*jĕp'sŭn*), HELEN, lyric soprano, born at Titusville, Pa., Nov. 28, 1905. After studying at the Curtis Institute of Music, Philadelphia, Pa., she made her debut as a singer in the same city in 1931. For her premiere at the Metropolitan Opera House in New York City she created the role of *Helene* in Seymour's new opera, "In the Pasha's Garden." Remaining with that company, Miss Jepson has also toured as soloist with prominent American orchestras and has appeared frequently on radio programs.

Jerboa (*jĕr-bō'ȧ*), or GERBOA, a genus of small rodents which are closely related to the rats and mice, remarkable for their long hind legs. These animals use their fore legs more like hands than as feet, and the prolonged hind legs cause their movements when running to appear as though they were flying. They burrow in the ground with the fore limbs, these being armed with powerful claws, and the long tail aids in holding the body in position while standing upon the hind legs, forming a kind of triangular support. In the winter they hibernate, especially in the colder countries, instead of storing up a supply of food as is the habit of mice. A number of species are native to Africa and Asia, and a similar ratlike rodent is found in the northern part of Europe. The jumping mouse common to North America belongs to the same class of animals. It is known locally as deer mouse.

Jeremiah (*jĕr-ē-mī'ȧ*), the second great prophet of the Hebrews, so named to distinguish him from seven others mentioned in the Old Testament. He was the son of Hilkiah, one of the priests of Anathoth, and filled the prophetic office for 37 years, covering the reigns of Kings Josiah, Jehoahaz, Jehoiakim, Jeconiah, and Zedekiah. In the 13th year of Josiah's reign, about 629 B.C., he was anointed, and at that time called himself a child. He lived through a very dark period of the history of Judah. Two powerful kingdoms were on either side—Egypt and Babylon. Josiah formed an alliance with Babylon and lost his life in fighting the Egyptians. Within the reign of Jehoiakim he prophesied of the destruction of Jerusalem and Judah, and later foretold that Nebuchadnezzar was appointed by God to bring upon Judah a time of desolation to last for 70 years. Zedekiah concluded an alliance with Egypt, but was defeated by Nebuchadnezzar. Jeremiah was treated kindly by the conqueror, who offered him the choice of a position in Babylon, or to remain with his chosen people. He elected to stay, but was later taken to Egypt, where, tradition says, he was put to death for talking against idolatry. He wrote two books of the Old Testament—*Jeremiah* and *Lamentations.*

Jerez de la Frontera (*hȧ-rȧth' dȧ lȧ frŏn-tȧ'rȧ*), or XEREZ, a city in the province of Cadiz, Spain, 16 m. N.E. of the city of Cadiz. It is situated on the Guadalete River, has railroad facilities, and is surrounded by a fertile country, which produces large quantities of fruits, especially grapes. The chief buildings include a Moorish castle, the Convent of La Cartuja, and several theaters. It is famous as a market for wine and as a place for bullfights. The place is mentioned as a Roman colony. In 711 it was the scene of a great battle between the Saracens and the Visigoths, in which the latter were overwhelmed. Population, *ca.* 67,500.

Jericho (*jĕr'ĭ-kō*), a famous city of ancient Palestine, on a plain 18 m. N.E. of Jerusalem and 6 m. W. of the Jordan River, near where that stream discharges into the Dead Sea. In the time of Solomon it was a flourishing city, exporting spices and balsam. Joshua made it his headquarters after his first entry into Canaan. It was destroyed by the Israelites and rebuilt by Hiel, the Bethelite, in 918 B.C. Later it was the seat of a school of prophets and the home of Herod the Great. Mark Antony assigned a portion of it to Cleopatra, Queen of Egypt. Subsequently it was destroyed in Vespasian's reign and rebuilt under Hadrian. It was repeatedly captured by the Crusaders and finally completely destroyed. The village of Er-Riha, with less than 300 inhabitants, now occupies the site.

Jericho, ROSE OF, the name of a small plant of the mustard family, native to Arabia. It is a climbing shrub, with a singularly shaped blossom of a greenish-yellow color. When dried, the leaves and blossoms fold together upward, but open again when placed in water, and this process can be repeated several times. The plant was brought from Palestine to Europe by the Crusaders.

Jeritza (*yĕ'rĭt-sȧ*), MARIA (MARIE JEDLITZKA), operatic soprano, born at Brunn, Austria, 1887(?). After studying with Austrian masters, she made her debut at 23 in "Lohengrin" at Olmutz. She

created the role of *Ariadne* in Richard Strauss' "Ariadne auf Naxos" at Stuttgart (1912), and the next year joined the Royal Opera at Vienna, remaining there until 1935. She appeared at the Metropolitan Opera Company in New York for the first time in 1921. Becoming an American favorite, she removed to the U.S. in 1940. She has also been prominent as a concert soprano.

Jeroboam I (*jĕr-ō-bō'ăm*), son of Nebat, made king of Israel after all the twelve tribes but those of Judah and Benjamin had revolted against Rehoboam, the son of Solomon. Jeroboam established idol worship in his kingdom, mainly to weaken the religious influence of Jerusalem, held by Rehoboam, who still reigned as king of Judah (I Kings 12:27). The Bible often uses the term "the sins of Jeroboam" to describe the sanction of idol worship by later Jewish kings.

Jeroboam II, son of Joash and king of Israel in the 8th century B.C. (II Kings 14:23-29). He repelled an invasion of Syria and re-established the boundaries of Israel approximately as they had been under David and Solomon. His reign marked Israel's greatest prosperity since Solomon, but the Old Testament books of Hosea and Amos suggest that the period was morally decadent.

Jerome (*jē-rōm'*), JEROME KLAPKA, humorist, born in Wallsall, England, May 2, 1859; died June 14, 1927. He studied at Marylebone and later became a clerk in a railroad office, tutor, actor, journalist, and shorthand writer. In the meantime he took an interest in literature and began reporting to several magazines, and was for a time proprietor of the magazines *To-Day* and *The Idler*. His writings include: "On the Stage—and Off," "Wood Barrow Farm," "Idle Thoughts of an Idle Fellow," "New Lamps for Old," "Three Men in a Boat," "Diary of a Pilgrimage," "Sketches in Lavender," "John Ingerfield, and Other Stories," and "Observations of Henry."

Jerome, SAINT, one of the greatest doctors of the Church, born at Strido, Dalmatia, between 340 and 350 A.D., of Christian parents; died Sept. 30, 420, in Bethlehem. He was educated in Rome. A visionary experience after an illness made him decide to become an ascetic. He, therefore, went into the desert of Chalcis, traveling later to some cities of the eastern part of the Roman Empire. He visited Antioch and Constantinople, where he fell under the influence of St. Gregory of Nazianzus and began to write theological tracts. In 382 he went to Rome and there undertook to translate the works of the scholar and theologian, Didymus of Alexandria, and, far more important, to revise and retranslate the Latin Bible with the help of older Greek manuscripts. This translation finally became the version known as the Vulgate (*q.v.*). While he worked on these translations, he founded an ascetic kind of order, with the purpose of influencing the Roman women and of educating them to a more moral life. However, his protector, Pope Damasus, died in 384, and Jerome left Rome in the following year. In 386 he settled in Bethlehem, where he founded a monastery and three convents, all characterized by their literary and intellectual culture. He himself continued to write, especially legends of saints and biographies of Church doctors. He became involved in many of the then raging bitter feuds within the Church, with varying success. Although he had many enemies, he was always recognized as the most scholarly of the Church men of his time.

Jerome, WILLIAM TRAVERS, jurist, born in New York City, Apr. 18, 1859; died 1934. He studied at Amherst Coll. and the Columbia Law School, and in 1884 was admitted to the bar of New York. After practicing for some time, he was elected a justice of the court of special sessions. In 1895 he was chosen district attorney of New York County as a Democrat, and in 1905 was re-elected as an independent candidate. He was prominent as a member of the bar association of New York and attained prominence in prosecuting many who were indicted on criminal charges, including Harry K. Thaw for the murder of Stanford White.

Jerome of Prague, religious reformer, born in Prague, Bohemia, in 1365; suffered martyrdom May 30, 1416. He studied at Prague, Heidelberg, and Paris, and for some time taught in the Univ. of Cologne. In 1407 he returned from a journey to Jerusalem, and soon began to spread the doctrines of John Huss and Wycliffe. He was imprisoned at Vienna for teaching the new doctrine, but was released through the entreaty of his friends in Bohemia. When Huss was in prison at Constance, in 1415, Jerome went there in accordance with a previous promise to defend his companion before the council. Soon after, he was arrested by the order of the Prince of Sulzbach, but his learning and power of debate enabled him to answer all arguments directed against his teaching. In 1415 he made a recantation of his views as to the sacrament, but the following year he solemnly retracted the recantation and was condemned to be burned at the stake. He met his fate with courage, and his ashes were taken to the Rhine and thrown into the waters.

Jersey (*jĕr'zĭ*), the largest of the Channel Islands, located in the English Channel, 16 m. w. of the coast of France. It is about 12 m. long from east to west, has a width of 6 m., and the area is 45 sq. m. The surface is high and rocky, but many of the valleys are unusually fertile. Large quantities of apples, pears, grapes, peaches, and other fruits are exported. Shipbuilding and oyster fishing are productive industries. The Alderney and Jersey breeds of cattle are grown extensively for dairying and export purposes. St.

Helier is the principal town. Jersey was occupied by German forces on June 30, 1940, during World War II. Population, 1951, 57,296.

Jersey City, second-largest city in New Jersey and seat of Hudson County, situated on a peninsula between the Hudson River and New York Bay (on the east) and the Hackensack River and Newark Bay (on the west). The city occupies a land area of 19.2 sq. m. and has a waterfront of 11 m. Its residential section is 169 ft. above sea level. Lincoln Park (282 acres) provides the most extensive recreational facilities and is the site of the Soldiers' Memorial and the Lincoln Statue. Jersey City is served by the Jersey Central Lines and the Pennsylvania and other railroads. Opposite the lower end of Manhattan Island, it is connected with it by the Holland Tunnel (vehicular), the Hudson tubes, and by ferries. The city's waterfront facilities are part of the Port of New York.

The city is an important industrial center, and its products include packed meats, containers, soaps, and chemicals. It is the center of a standard metropolitan statistical area (pop., 1960, 610,734) including all of Hudson County. The city had a value added by manufacture of $374,030,000 in 1958.

The public-school system enrolls *ca.* 30,000 pupils annually, the parochial-school system another 23,000. Jersey City State Coll., St. Peter's Coll., and one of the university colleges of Rutgers, The State Univ., are located in the city. The Jersey City Philharmonic Symphony Society (founded, 1939) is the only major symphony orchestra in the state. A museum is maintained at the main library building; art galleries are in one of its branches.

The site of Jersey City was part of the patroonship of Pavonia in 1630. At that time it was a small sandy peninsula known as Paulus Hook. Settlement began in 1634, when a small trading and farming community grew up. In 1779 Maj. Henry ("Light-Horse Harry") Lee (*q.v.*) led a daring and successful raid on its British garrison. The town of Jersey was incorporated in 1820, becoming Jersey City in 1838. In 1869 it was consolidated with Hudson City and Bergen City. Greenville was joined to it in 1873. In 1916 Jersey City was the scene of the *Black Tom* explosion (*q.v.*). For more than 30 years, until the adoption of a commission form of government in 1950, "Boss" Frank Hague and his family dominated municipal affairs.

The population of Jersey City, which was 6,856 in 1850, increased to 163,003 in 1900 and to 316,715 in 1930; it decreased to 301,173 in 1940, to 299,017 in 1950, and to 276,101 in 1960.

Jerusalem (*jē-rōō'sə-lĕm*), a historic city of Palestine, occupied partly by Jordan and partly by Israel and claimed as national capital by Israelis. Revered as a holy city by Jews, Christians, and Mohammedans, Jerusalem is situated 15 m. w. of the northern end of the Dead Sea and 35 m. E. of the Mediterranean, *ca.* 2,500 ft. above sea level, on the slopes of two hills. Near it are two

MONTGOMERY STREET, JERSEY CITY
Courtesy Jersey City Chamber of Commerce

Courtesy City Development Engineer, Jersey City
JERSEY CITY MEDICAL CENTER

THE WAILING WALL IN JERUSALEM
Courtesy Canadian Pacific Steamships

Courtesy Canadian Pacific Steamships

JERUSALEM. MOUNT OF OLIVES

ravines, the valley of Hinnom being toward the south and the valley of Jehoshaphat toward the east. A third depression, the Tyropean Valley, extends through the city from north to south. Mt. Zion, a celebrated eminence on the southwest, rises 300 ft. above the surrounding surface. Other eminences include Mt. Akra on the northwest, Mt. Bezetha on the northeast, Mt. Moriah on the east, and Mount of Olives east of the city.

Jerusalem is mentioned as early as 1500 B.C., when the Jebusites were in possession. Joshua conquered a portion of the city, but they maintained control of at least the upper part until the time of David, who made it his capital and strengthened the portion known as Zion. In the time of Solomon it attained its greatest prosperity, but began to decline shortly after his death. Nebuchadnezzar took it from Zedekiah in 586 B.C. after a protracted siege, carried many of the Jews to Babylon in captivity, and left it in a desolate condition. Cyrus permitted the Jews to return to it from captivity. In 515 they rebuilt the temple, but the walls were not replaced until 455, in the time of Ezra and Nehemiah. It was destroyed again by the Romans under Titus (*q.v.*), A.D. 70, a conquest which resulted in the almost complete destruction of Judaism as a political factor. The Roman Emperor Hadrian rebuilt the city between A.D. 131 and 136, calling it *Aelia Capitolina*. It then slowly regained its prosperity, especially under Constantine the Great.

With the Mohammedan conquest, in 638, it became a possession of Caliph Omar I (*q.v.*), and continued under Moslem rule until 1099, when the Crusaders occupied it and established the Latin Kingdom of Jerusalem (see *Crusades*). A desperate war between European Christians and Moslems prevailed for 87 years, during which many lives were lost and many institutions were ruined, but finally the city was taken by Saladin in 1187. In 1244 it came under complete Moslem control, being held by the Egyptians until 1517, and by the Turks until World War I. In 1917 it was occupied by Great Britain in a campaign against the Turks.

The various parts of Jerusalem are of intense interest to the Jewish and Christian travelers as they explore the old portions of the city, visiting the various historic places, such as the site of Solomon's temple, the palace of Jewish kings, the localities frequented by Jesus Christ, and the place of the Holy Sepulcher. Many excavations have been made to study localities of interest, while the ruins and structures remaining intact have been scrutinized with a devoted reverence. Formerly three walls provided amply against invasions, though these are now largely among the ruins. The *Wailing Wall*, a wall 156 ft. in length, represents the last remains of the ancient temple of Jerusalem. From all over the world Jews come to pray at the Wall. It is remarkable that far more of the old city remains than is left of Carthage, Corinth, Tyre, or even Rome. A majority of the buildings are one-story and present a unique appearance as they skirt the numerous tortuous streets. The manufactures are not important, including chiefly jewelry, clothing, fabrics, crucifixes, and utensils. In 1893 a railroad was opened to Joppa. The railroad commerce, telegraphic connections, and other modern facilities have since been enlarged and brought into extensive use.

Besides the beautiful Church of the Holy Sepulcher, there are numerous Christian edifices, convents, and institutions of learning. Several mosques are maintained in conspicuous places, the most important being the Mosque of Omar, which occupies the site of Solomon's temple. Fifty years ago the inhabitants all lived within the city walls. Zionism (*q.v.*) made a modern city of Jerusalem. There is a Jewish Univ. and Art Acad. The city has several fine hospitals, seminaries, and elementary schools. A Hebrew Univ. has been opened on Mt. Scopus (1925). The British army, under Gen. Allenby, captured the city and a large number of Turkish prisoners in 1917. Jerusalem became the capital with the formal establishment of Palestine and a mandate of Great Britain (1923). In the fighting which took place between Arabs and Jews after the termination of the British mandate in 1948 the city was the scene of much bitter fighting and some of its holy places were damaged. With the partition of Palestine (*q.v.*) by the U.N. in 1948, Jerusalem was set up as an international zone under a U.N. trusteeship. An area of 289 sq. m. was set aside by the U.N. as the enclave of Jerusalem; however, the occupation of the Old City by troops of the

Hashemite Jordan Kingdom and of the New City by Jewish forces prevented the U.N. from actually taking over the administration of Jerusalem. Population, *ca.* 80,000 Jordanians; 160,000 Israelis.

Jessup (*jĕs'ŭp*), PHILIP C., jurist and government adviser, born in New York City, Jan. 5, 1897. He was educated at Hamilton Coll., Yale Law School, and Columbia Univ. He was admitted to the bar of the District of Columbia in 1925, but soon returned to Columbia Univ. as lecturer in international law, attaining full professorship in 1935. Considered an eminent authority in his field, he was engaged in numerous governmental and international legal activities, and traveled widely for the State Dept. He was appointed legal adviser to the American Ambassador to Cuba (1930), and held positions with the Carnegie Endowment for International Peace (1941), the U.N. Relief and Rehabilitation Administration (1943), and the U.N. Monetary and Finance Conference at Bretton Woods (1944). He was a member of the U.S. delegation to the U.N. Charter conference at San Francisco (1945), and in 1947 was appointed U.S. representative to the U.N. committee on the codification of international law. In 1948 he was named deputy representative to the Little Assembly of the U.N. General Assembly, and was a U.S. delegate to the Assembly in 1949, 1951, and 1952. He served as U.S. Ambassador at Large, 1949-52, and was appointed senior adviser to the Secretary of State in 1950. In November 1960, he was elected to the International Court of Justice (*q.v.*) at The Hague for a term to end Feb. 5, 1970.

Jester (*jĕst'ĕr*). See *Court Fool.*

Jesuits (*jĕz'ū-ĭts*), or SOCIETY OF JESUS, a monastic order of the Roman Catholic Church, founded (1536) in Paris by Ignatius of Loyola. Originally the special function of the order was to care for the sick and to fortify the position of the pope within the church. This latter function soon became the principal one of the order and thus it is not surprising that the order was approved by Pope Paul III as early as 1540, the first generalship being vested in the founder. By the time Ignatius died in 1556 (canonized in 1622), his order had increased from 60 to more than 1,000 members. The members had to vow not only chastity, poverty, and implicit obedience to authority, as did other monastic orders, but, especially, compliance with the commands of the pope in going to any country and under any conditions to convert heretics and infidels, especially Moors and Jews. This missionary zeal was concentrated as much on their work in India and Japan (see *Xavier, Saint Francis*) as inside Europe.

Their special obedience to the pope naturally caused the Jesuits to fight the greatest danger to the Roman Catholic Church, Protestantism. Through this fight, the Jesuits developed political talents which soon made the members of the order the most versatile representatives of the Catholic Church in worldly affairs. In order to achieve this goal, a complicated organization of utmost rigidity was developed. The Jesuits received the rights both of mendicant orders (*q.v.*) and of secular priests. They recognized only the superiority of their general and the pope. This gave them great worldly power. Furthermore, from their inception they devoted much interest to education and early in their history were appointed to many highly important chairs of theology at the leading universities of Europe. They adopted as their motto, "To the greater glory of God" (*Ad majorem Dei gloriam*).

Associated with all layers of society, from the humble to the powerful, the Jesuits combined great intellectual versatility and a shrewd political apprehension with a deep religious mysticism which was especially connected with the adoration of the Blessed Virgin. A certain soldierly spirit was furthered by the constitution of the order which provided severest punishment for members who did not comply with their vows.

The scientific and educational activities of the order served the purposes of the Catholic Church as well. The Jesuits tried also to restrain nationalistic tendencies everywhere and to emphasize the universality of the Catholic Church. Their missionary branch was no less important. Due to the fact that they worked principally in the Indies, Japan, China, and Abyssinia, the Jesuits' spiritual work was often connected with the

POPE PAUL III APPROVING THE FORMATION OF THE SOCIETY OF JESUS

play of power politics. Thus they often played, directly or indirectly, a vital role in the political and economic conquest of the countries in which they served. On the other hand, it is the Jesuits to whom we owe most of our knowledge of China, Japan, Central America, Mexico, and many other parts of the world in the period between the 16th and 18th centuries. Flourishing particularly in Spain and Portugal, members of the order were among the first to set foot on the Spanish and Portuguese colonies in America.

Their remarkable rise to power at European courts and among the people led many institutions of learning, their teachers, and the non-Jesuit clergy to fear the Jesuits. It was largely for this reason that the parliament of France resisted the Jesuits in their attempts to obtain a foothold. With the assistance of the Guise (*q.v.*) family, however, they succeeded in gaining legal recognition in 1652, but were required to renounce some principles. Their power in Germany gave them marked prestige after 1549, when they secured chairs in a number of universities and exercised political influence, but they lost some power by the Jansenist (*q.v.*), controversy. Soon after, the famous "Provincial Letters" from the pen of Pascal weakened their influence by pointing out doctrines and practices which he considered dangerous and vacillating, and calling attention to their consecration to the policy that "the end justifies the means."

By 1710, the order had more than 19,000 members and more than 22,000 by 1749. Increasingly feared and suspected by many European rulers, they were first driven out of Portugal (1759), and other countries followed suit. In France, the court, under the leadership of the Marquise de Pompadour (*q.v.*) fought them, and they were finally expelled in 1764. Three years later Spain revoked its approval of the order.

In 1773, Pope Clement XIV suppressed the entire Jesuit order by a papal bull, but in 1814, it was restored by Pope Pius VII.

This latter action was generally acclaimed because the European monarchs believed that the order was especially equipped to fight the spirit of the French Revolution. Later in the 19th century, however, the Jesuits were alternately driven out and permitted to exist in various European countries. They had to leave Italy in 1861, but were allowed to return in 1929. They were expelled from Germany in 1872, but permitted to exist there again after the fall of the Empire in 1918. In France the order was frequently expelled and restored after 1830 and finally permitted to return in 1919. England, Ireland, and the U.S., however, never passed any laws against the Jesuits.

At present, the order totals about 25,000 members in 50 "provinces," several of them in the U.S. Their influence on the hierarchy of the Catholic Church has increased continually since about 1860. In the U.S. they possess a large number of educational institutions, the most noteworthy being in New York City; Washington and Georgetown, D.C.; Baltimore; Buffalo, N.Y.; St. Louis, Mo.; New Orleans, La.; Denver, Col.; Cincinnati and Cleveland, Ohio; Omaha, Neb.; and San Francisco, Cal.

Jesup (*jĕs'ŭp*), MORRIS KETCHUM, philanthropist, born at Westport, Conn., in 1830; died in 1908. After studying in New York City, by 1852 he had become a successful merchant and banker. Among his many philanthropic enterprises were the endowment of a hall at Union Theological Seminary, the building of De Witt Memorial Church for the New York City Mission, and contributions to the American Museum of Natural History. He financed several expeditions to the Arctic regions, gave funds to the Audubon Society, and was a co-founder of the Young Men's Christian Assn.

Jesus Christ (*jē'zŭs krīst*), the Greek form of the Hebrew word Joshua, contracted from Jehoshua, meaning Jehovah or Savior. It is the name applied to the Son born of the Virgin Mary, who had conceived, of the Holy Ghost, the third person of the Divine Trinity.

In Greek, the name *Jesus* means savior and is explained as such in many places in the New Testament, especially Matthew 1:21. *Christ* signifies the anointed, in other words, the consecrated, but is also equivalent to the Messiah. It is a basic supposition of the Gospels that Christ is the Messiah so long expected by the Jewish prophets, and this fact is emphasized by many passages in all of the Gospels. This fact is the decisive difference between Jews and Christians: That the Jews do not recognize Christ as the Messiah.

His life represents the contents of the Gospels written by the four evangelists, Matthew, Mark, Luke, and John. He was born in Bethlehem, Palestine, in the year 4 B.C., the Christian era being designed to date from the birth of Christ, though an error in reckoning the date makes it quite certain that Jesus was born four years before the chronology accepted by the Christian nations. The date of His birth was fixed by Dionysus Exiguus in the 6th century, but historical examination proved Dionysus' error by comparison with certain historical events of Roman history. His mother, the Virgin Mary, was of the tribe of Judah, betrothed to Joseph, a carpenter by occupation, and their genealogies are given in Luke and Matthew respectively. All these facts can be conceived of as being prophesied in various passages of the earlier prophets. Joseph and Mary went to Bethlehem, the city of David, in order to be taxed, as inhabitants of the whole Roman empire were supposed to do

JESUS CHRIST

Mosaic from the Church of Saints Cosmas and Damian, Rome, *ca.* 530

when Herod was the king of the Jews. Since there was no room at the inn where they stopped, they stayed in a stable and it was there that Christ was born. Simple shepherds were the first to whom angels had brought the announcement of the event and who had come to be witnesses of the miracle. Their humble station in life is of symbolic significance in Christianity. Jesus' circumcision and the first years of His life were those of any other Jewish child of that time, with the exception of the visit of the Wise Men from the East, probably Persian priests of the Zend religion who, guided by a miraculous star, came to venerate Him. It was this event which made King Herod issue an edict requiring the destruction of the male children at Bethlehem less than two years old, which caused Mary and Joseph to flee with the Child to Egypt for safety. After the death of Herod, they took up their residence in Nazareth in Galilee, from which circumstance Jesus is often alluded to as the Nazarene.

The first miraculous event conveyed to us by the Gospels is the story of Christ as a 12-year-old boy discussing matters with the priests of the temple and revealing extraordinary wisdom. Aside from this event, His life went on while he probably worked as a carpenter. No events from this period of His life are related to us.

The political reconstruction of the kingdom of Judea under the rule of Herod the Great had broken down after his death. The Jews became unruly and were pacified by certain con-

cessions by the Romans. Finally, Judea was annexed by Rome and governed by a Roman procurator. Roman political power influenced even the selection of a High Priest. Under Pontius Pilate as procurator of Judea, John the Baptist began to teach in the line and style of the prophets of the Old Testament.

Annas and Caiaphas were then the High Priests. Through John's work, the expectation of the Messiah grew again. The idea of baptism was probably without precedent in Jewish life. In any case, Jesus came to be baptized by him. After this baptism, Jesus went into the wilderness and there was tempted by the Devil. This temptation has, of course, by the very nature of Christ, an allegorical meaning, proving the eternal existence of evil and of sin.

From that time on the real ministry of the Lord begins. Matthew, Mark, and Luke tell of it as happening in Galilee, while John refers mostly in his Gospel to the events in Judea. Certain discrepancies between the three first and John have been the topic of endless theological discussions which finally found their solution in the concept that all the Gospels represent not chronological histories, but rather pictures and impressions, especially since more than half of the fourth Gospel, St. John's, is dedicated to the last three months. The duration of the ministry lies between two and three years and is followed by the Passion.

The records of the ministry consist essentially of the narration of His worked miracles, of His teachings and of the description of the reactions of those who witnessed the Savior's deeds and teachings. The miracles of Christ are essentially the raising of the dead and healing of the soul and body (Lazarus, the palsied and leprous), and individual acts of changing the ordinary laws of nature. The deeds of Christ were not done as sensational feats but merely as proofs of the divine nature of Christ and of His mission. This is proved by the fact that Christ Himself did not want to have these miracles recorded unless in connection with the concept of His person and of His teaching. Actually, the miracles have no meaning at all, if not in connection with the central wonder of the Incarnation. The very existence of Christianity proves that, and it is the approach toward this central problem which makes men believers or non-believers. The conviction of the divine nature of Christ, and with it the belief in the basic miracle of Incarnation, has to be left to the personal religious belief of each individual. His teachings in the Parables, and especially in the Sermon on the Mount, have been recognized and admired by followers of each religion in the world. Their content continues the basic ethical ideas of the Old Testament but enriches them by changing the ideas of vengeance. The Parables use the ancient Oriental form of allegory to convey their essential meaning. Thus, the very essence of Christ's Parables does not lie in the use of allegorical narration but in their content. They do not conceal; they explain.

After Christ had left Galilee to be baptized, and to expose Himself to temptation, He went to Capernaum and then to Jerusalem for the Passover. The cleansing of the temple is the central event of this period. After that He went with His disciples to the Jordan to baptize them. Following the clarification of the mission of St. John, Christ went through Samaria and from there to Galilee to Nazareth. He taught in the synagogue there and preached in other towns in Galilee (the healing of a leper, the raising of Jairus' daughter). Then He went again to Jerusalem and His discussions with the Pharisees (*q.v.*) began. Christ went on to teach the chosen Twelve Apostles, whose number was a symbolic one, probably denoting the number of Jewish tribes. Finally he sent them out to convert the Galilean people while He alone continued His journey. After they returned they went with Him and witnessed the miracle of the loaves and fishes. The passage over the Sea of Gennesaret followed as did many other miracles. Many thousands began to follow Christ, recognizing Him as the son of the living God. Discussions among the Apostles and of the Apostles with Him make it clear that His kingdom was near. The Transfiguration (*q.v.*) of which Peter, John, and James were the only witnesses had to be concealed until after the Resurrection. After they returned from the Mount, Christ accomplished the healing of the lunatic boy, a happening whose very meaning lies not in the physical miracle but in the symbolization of faith. The healing of the lepers in Samaria and the pardoning of the adulterous woman followed. In discussion with the Apostles Christ hinted of His future sufferings and also of the coming of the Kingdom, two facts the Apostles were unable to understand and reconcile. After taking part in the Feast of Dedication, Christ went to the Jordan for the second time and then to the family of Lazarus where He finally worked the miracle of awakening Lazarus from the dead after Lazarus had been in the grave four days. It was this miracle which convoked the Sanhedrin (*q.v.*) and it was there that Caiaphas, the High Priest, prophesied that Jesus would "die for His nation" in order to avoid the persecution of the Jews by the Romans who felt that the followers of Christ were a public menace. At this point begins the actual story of the Passion (*q.v.*) of Christ and of His Resurrection (*q.v.*).

Jesus, LOVER OF MY SOUL, start of the first stanza of a well-known hymn by the English

clergyman Charles Wesley (*q.v.*), written in 1740.

Jet (*jet*), a black, mineralized vegetable product similar to lignite. It is light, hard, and capable of being turned easily or cut into articles for charms and ornaments. It takes a fine polish. Jet is found in many parts of Europe and Asia, particularly in Asia Minor and France, and at Whitby, in England. Jewelry and various articles of ornament are made of jet, though excellent imitations are produced from rubber and from glass. There are hard and soft varieties of jet, but the former is the only type used in the manufacture of the highly polished commercial products.

Jet Propulsion (*jĕt prō-pŭl'shŭn*), the method of moving a body by utilizing the thrust of high-velocity gases. Jet propulsion is an application of Newton's Third Law of Motion—that for every action there is an equal and opposite reaction. Reaction is used to propel many kinds of bodies, but the principle remains the same. It is reaction that causes a Fourth-of-July skyrocket to soar aloft. Reaction power sends man's probes into space and artificial satellites into orbit. Reaction enables airplanes to fly at twice the speed of sound—or at more than 1,400 m.p.h. The commonest method of producing high-velocity gases is to ignite a combustible in the presence of oxygen. The fuel in the simplest of the reaction engines for jet propulsion is, like that in the skyrocket, a solid substance incorporating its own oxygen for combustion. Gunpowder is an example of this. Among the most complex reaction engines are those that power the space probes. The rockets that they thrust into space must have room for both the fuel to produce the immense power required and the oxygen supply to burn it. Reaction engines carrying their own oxygen supply can operate outside the earth's atmosphere (for such units, see *Rocketry*). Reaction engines that depend on atmospheric oxygen for combustion are divided into four types.

(*1*) The first basic type of jet engine was the "Campini Caproni Unit," in which a blower was driven by a reciprocating gasoline engine, and the air pressure thus generated was fed into a combustion chamber where it was mixed with fuel, burned, and allowed to escape through an adjustable nozzle into the air, thus creating thrust. This unit was made obsolete by the Whittle centrifugal-flow and the German axial-flow types, in which the blower is driven by the gas turbine which extracts its power from the gases escaping from the combustion chambers. The axial flow gas turbine is the standard jet-propulsion unit for both military and commercial aircraft at the present time.

(*2*) The second type is the impulse negative-induction jet unit (the pulse-jet). The chief example of this was the German V-1 bomb, which was a long-distance missile equipped with wings. These units achieved a speed of 500 m.p.h. and traveled from Holland and Belgium to most parts of central England and did an enormous amount of damage. The V-1 consisted of a combustion chamber equipped with slatlike valves on the intake side which faced the oncoming air. The exhaust end of the chamber was equipped with a straight tube. Thus air entered the valves, was mixed with fuel, and burned. The charge in passing out of the tube created an induction in the chamber which opened the vane valves and thus allowed the cycle to repeat about 30 times per second.

Courtesy Trans World Airlines

ADVENT OF THE JET AGE

The Boeing 707 streams vapor trails as its four jet engines deliver up to 13,000 lb. of thrust. The airliner can reach take-off speed of 158 knots in 55 sec., using 7,300 ft. of runway. It climbs to a cruising altitude of 31,000 ft. in 32 min.

(*3*) The third type is the ram-jet unit, which is simply a combustion chamber with constrictions on the intake and discharge ends and a method of mixing fuel into the incoming air. These units do not operate efficiently below the speed of sound. They have been used experimentally for guided missiles and have recorded speeds up to 1,500 m.p.h. Their chief troubles are extremely hard starting and extremely low efficiencies at slower speeds. They are known as Athodydes. The U.S. Navy has linked the basic Athodyde with an inertia tube to create a pulse and calls this unit the "flying stovepipe" because of its appearance.

(*4*) The fourth and last type is the positive-induction impulse jet, which is still in the experimental stage. See also *Air Warfare; Aviation; Gas Turbine.*

Jetty (*jĕt'i*), a construction of masonry or

wood which projects into the sea, or some other body of water, as a wharf or pier for landing and shipping, or as a mole to protect a harbor. Jetties of another kind are constructed in rivers for the purpose of increasing the current and depth by narrowing the channel. Among the most noteworthy in the U.S. are those at the mouth of the Mississippi, which have caused the depth of the river to be increased from 7 to 30 ft. These were planned and constructed by Capt. James B. Eads (*q.v.*), in 1875, under an order of Congress to improve the South Pass of the Mississippi. He built two parallel jetties with a channel of 350 ft., the west jetty being 7,800 ft. and the east jetty being 11,800 ft. long. The longest jetty in the world, that at the mouth of the Columbia River, is nearly 5 m. long. Other American jetties are at Charleston, S.C.; in the St. John's River, Florida; and at the mouth of Sabine Pass, Texas. Among the many jetties of Europe those in the Danube are of greatest utility, since they have increased the depth of the main channel of its principal mouth by 20 ft. and made navigation by the largest steamships possible. In numerous places jetties are serviceable in retarding the advance of sand and gravel bars.

Jeunesse d'Orée (*zhû-nĕs' dō-rā'*), French meaning gilded youth; since the time of the French Revolution (*q.v.*), this term has been applied to wealthy young men leading frivolous lives unconcerned with the world's troubles.

Jevons (*jĕv'ŭnz*), WILLIAM STANLEY, political economist, born in Liverpool, England, Sept. 1, 1835; died Aug. 13, 1882. He studied at Univ. Coll., London, and at London Univ., and then settled for five years at Sydney, Australia, where he was employed in the mint. In 1866 he was appointed professor of mental philosophy, logic, and political economy at Owens Coll., Manchester, and in 1876 secured a similar appointment at Univ. Coll., London. Among his best-known works are: "Serious Fall in the Production of Gold," "Theory of Political Economy," and "Investigations in Currency and Finance."

Jew (*jū*), THE WANDERING. See *Wandering Jew*.

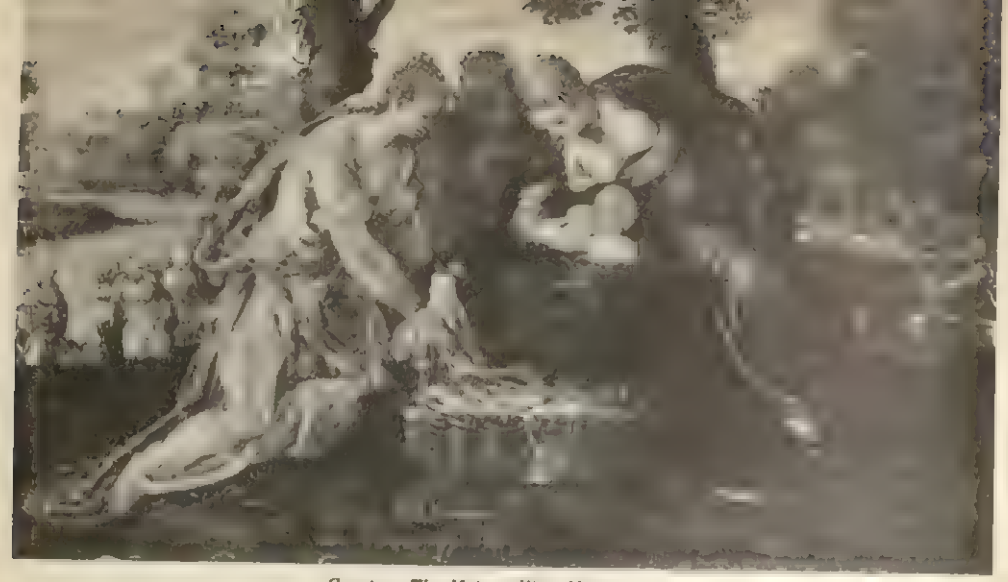
Jewelry (*jū'ĕl-rỹ*), precious stones, gems, and ornaments prepared by jewelers; also the art of mounting precious stones. Jewelry made of metals, amber, alloys, coral, and other materials have been used as personal adornments from the earliest periods of history, and have been commonly worn by peoples in all stages of savagery and civilization. Relics found in the tombs of ancient Egypt, Peru, and Mexico indicate that jewelry was highly prized. Many antiquities obtained in Egypt indicate that gold work of the highest quality was used extensively for ornaments about 3,000 years ago. In many of the European museums are splendid specimens of ancient Roman and Greek jewelry produced by Etruscan artists, these being secured from the tombs of Etruria. The jewelry trade of modern times is an important branch of industry. In America its greatest center is in New York, while Paris, Berlin, Vienna, and London are important European centers of the manufacture and trade in jewelry.

Jewett (*jōō'ĕt*), SARAH ORNE, author, born in South Berwick, Me., Sept. 3, 1849; died June 24, 1909. She studied at the Berwick Acad. and traveled extensively in Europe and America. Her writings deal largely with provincial life in New England, which she portrays in its finer and gentler moods. Though she produced a number of novels, her works consist chiefly of short stories and sketches. Among her principal works are: "Old Friends and New," "The King of Folly Island," "A Native of Winby," "A Marsh Island," "The Country Doctor," "The Country of the Pointed Firs," and "The Queen's Twins."

Jewfish (*jū'fish*), the name of several large fishes found along the coast of California and in the Gulf of Mexico. The common jewfish, or *black grouper*, has a large head and mouth and at maturity weighs about 300 pounds. It is found off the the coast of Florida and in the West Indies. The jewfish of California is much larger, frequently weighing 500 pounds. It frequents rocky islands, has a brownish color, and is commonly called *black sea bass*. This fish is prized for food and commands a high price in the market.

Jewish Theological Seminary of America (*jū'ish*), founded in New York by S. Pereira Mendes and Sabato Morais in 1887; it trains rabbis, teachers for elementary and secondary Hebrew schools, and lay Jewish leaders. It also conducts the Institute for Religious and Social Studies, a study-conference for clergymen of all faiths on inter-group problems with branches in Boston and Chicago. The Seminary, focal point of conservative Judaism in America, has an annual enrollment of about 1000 students in all its rabbinical schools. Morais, its first president, was succeeded by Solomon Schechter, 1902-15, Dr. Cyrus Adler, 1915-40, and the present head, Dr. Louis Finkelstein. The Seminary includes perhaps the finest Jewish library in the world, with 8,000 manuscripts, 135,000 printed volumes and a museum of sacred and ceremonial objects. A weekly radio program, "The Eternal Light," heard by an estimated audience of 5,000,000, is prepared under the auspices of the Seminary.

Jews (*jūz*), a people bound together by their adherence to the Jewish tradition, or Judaism (*q.v.*); they are frequently described as the remnant of the ancient people of Israel, descended from Abraham, but with large numbers of people from other tribes added. They are also called Hebrews and Israelites, but the last



Courtesy The Metropolitan Museum of Art, Gwynne M. Andrews Fund, 1939

THE FINDING OF MOSES

Oil painting by Tintoretto (1518-94)

two names apply more properly to them before the Babylonian captivity. In their early period they were linked closely with Palestine. Today the word Jew comprises, however, not only a specific racial origin but also all those who adhere to the Jewish religion and who sometimes may be of very different racial origin. Their community consists primarily in certain common habits handed down over many years, ways of thinking, preferences, and psychological reactions, rather than in a common biological denominator.

Ancient History. Jewish history dates from the time when the patriarch Abraham left Ur of the Chaldees and settled in Canaan or Palestine, probably around 2000 B.C. He and his descendants, the houses of Isaac and Jacob, flourished in the southeastern part of Palestine until Joseph, a son of Jacob, came to Egypt. As the Bible tells, he was sold by his brothers as a slave. At the time of a widespread famine Jacob and his other 11 sons were induced by Joseph to emigrate to Goshen, Egypt, where their descendants flourished with marked prosperity for 430 years. During the latter part of the period, however, they were treated as bondsmen and held in abject slavery.

It is thought that Rameses II was the Pharaoh who first oppressed the Israelites, and that their deliverance was effected during his reign. About 1280 B.C., Moses (*q.v.*) became their deliverer and led them out of bondage, directing their famous exodus and wandering in the desert in the vicinity of Kadesh, near the boundary of Palestine. During this period they numbered, according to most recent research, about 200,000. They were divided into 12 tribes according to their descent from the 12 sons of Jacob, receiving in the wilderness through Moses, direct from God, the Ten Commandments on Mt. Sinai and a complete policy of government. All the laws imposed upon them in the Pentateuch (*q.v.*) were given as eternally binding. Their government was theocratic. The hereditary priesthood was vested in the tribe of Levi, originally under the direction of Aaron, the elder brother of Moses, and constituted the central idea of national unity.

The essential doctrines of Judaism are contained in the laws as given by Moses and developed through later Jewish tradition. For the Jews, these laws represent the eternal Covenant of God with his chosen people. The science of comparative religion has been able to trace certain of these laws to older Oriental doctrines, although the ethical content of the Ten Commandments was here articulated for the first time.

At the close of the extended wanderings in the wilderness they marched northward to found settlements in Palestine, but Moses died before setting foot upon the land of promise and was succeeded by Joshua, who led the hosts of Israel and successfully conquered the regions west of the Jordan from the Canaanites between 1270 and 1230 B.C. However, the native peoples were not entirely subjugated at that time, though the lands were divided among the 12 tribes, each receiving a district more or less separated from those of the others, and the whole was governed as a union of states under local chiefs. The grazing lands lying east of the Jordan were allotted to the tribes of Gad, Reuben, and the semitribe of Manasseh, and the others—Benjamin, Simeon, Dan, Judah, Ephraim, Zebulon, Asher, Naphtali, and the second semitribe of Manasseh—received lands west of the Jordan. The priestly tribe of Levi secured 48 cities, was allotted the tenth part of all agricultural products, and received authority to frequent any portion of the territory.

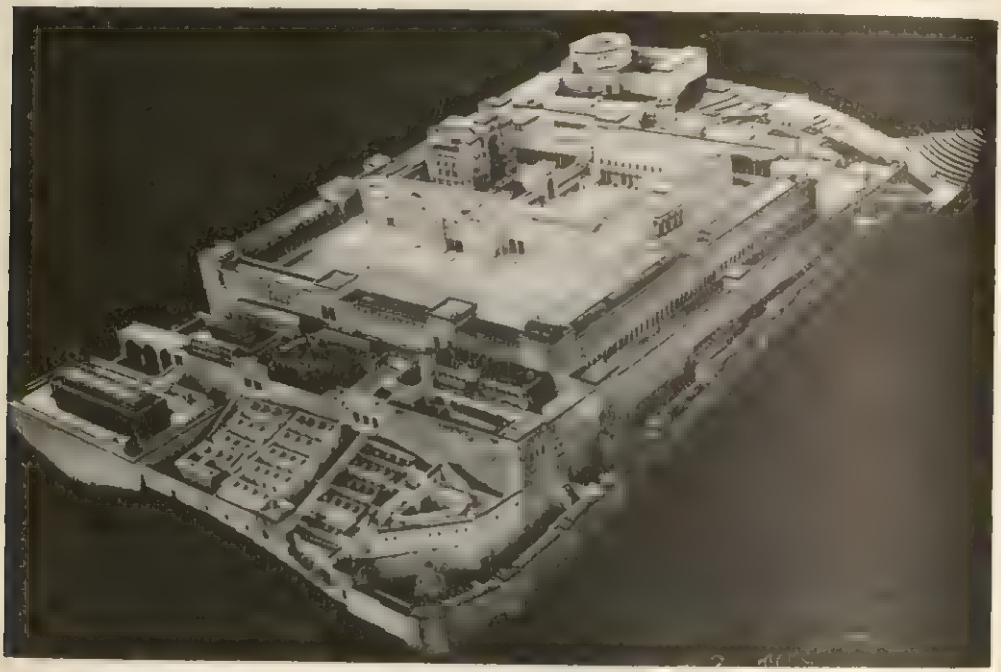
Joshua died before 1200 B.C., after which period the bonds of unity between the tribes grew less rigid, of which fact the Philistines, a people inhabiting the coast plains along the Mediterranean, took advantage and brought a portion of the Israelites under subjection. These wars were followed by the heroic age of the Jewish people, during which time they were governed by a succession of 15 judges, of whom the most noted were Deborah, Gideon, Jephthah, Samson, and Samuel. Samuel was the most successful ruler since Moses, the last of the judges, and, after popular entreaty by the people, inspired Saul, a Benjamite, to become king, he anointing him as ruler of all the Jews. Though a successful warrior, Saul lacked statesmanship. He succeeded in numerous battles against the Philistines until his final defeat and death at Mt. Gilboa. He was succeeded by David, his son-in-law, who ruled around 1000. The successful reign of David caused him to become known as the greatest king of the Jewish throne. The period including the reigns of David and Solomon is designated the golden age of Jewish history.

David (*q.v.*) rose from the tribe of Judah. He was a native of Bethlehem, came in conflict with Saul until the death of the latter, and established a separate principality with Hebron as its capital. After a war of seven years, all the tribes acknowledged David king, who now transferred the seat of government to Jebus, a fortress conquered from the Canaanites, which he named the City of David, and later Jerusalem. During his long reign of 40 years he conquered the Edomites, Moabites, Ammonites, and Philistines, and extended his dominion from Damascus to the northeast of the Red Sea. It was his son Solomon who at the beginning of the 9th century B.C. actually united all the tribes closely and intensified their religious life. He built the great temple in Jerusalem, negotiated treaties with Tyre and Egypt, and extended the commerce from Africa to Java and Sumatra. This sovereign effected many internal improvements and showed a wisdom that became proverbial, but in the later years of his life he was weakened greatly in influence by various causes which led to interior dissensions and insurrections. Quite obviously the political and economic expansion under Solomon had been too much for the Jewish people.

The monotheistic religion had brought about a high ethical level and lively religious interest which was furthered through regular pilgrimages of all the people to Jerusalem. Personal freedom granted the inviolability of the individual. Even foreigners had this freedom. Almost everyone was able to read and to write, much in contrast to the surrounding people. A great literature had developed of which the Psalms of David are just one example. Peculiarly, however, the Jews never excelled in plastic art. Foreign artists built the palace of David and the temple of Solomon. The law of Moses ruled not only religious life but all human and economic relations. Agricul-

ROMAN SOLDIERS REMOVING SACRED UTENSILS FROM THE TEMPLE

Relief from the Arch of Titus, Rome, constructed in 81 A.D.



Courtesy The Bettmann Archive, N.Y.

SOLOMON'S TEMPLE

This reconstruction of the historic temple conveys an impression of its renowned magnificence and splendor. Built in the 10th century B.C., the temple was destroyed twice, in the 6th century and A.D. 70

ture was the main source of income. The handicrafts existed not in the form of industrial production but as individual enterprises.

After the death of Solomon, the date of which is not exactly known (between 970 and 930 B.C.), the Jewish people became two nations, the kingdom of Israel under Jeroboam and the kingdom of Judah under Rehoboam. The latter kingdom consisted of the tribes of Benjamin and Judah and Levi, while Israel was constituted of the other tribes.

Peculiarly, two-fifths of the entire Old Testament deals with the period from the beginning until the division of the Jewish kingdom. The history from this division to the destruction of the First Temple (586 B.C.) takes only a twelfth part of the Old Testament. Thus we have to supplement the Biblical sources with our general archaeological and historical knowledge, which is fortunately rather ample for this period, since all peoples with whom the Jews came in contact left documentary records. The dates of Jewish history are firmly established by the contact of the Jews with the surrounding peoples whose history is definitely known. The capital of Israel was first established at Shechem, but later was transferred to Samaria. Rehoboam made a number of unsuccessful attempts to reconquer Israel, but was prevented by an Egyptian invasion under Shishak, and some time after Judah averted annihilation by Israel through an alliance with the Syrians. After varied successes in wars covering many generations, Shalmaneser, King of Assyria, subdued Israel and carried many of the leading citizens away into captivity. The succeeding Assyrian king, Sargon, completely destroyed the government of Israel and settled the principal inhabitants in Media and Assyria, while Assyrian colonists occupied the different regions, intermarried, and largely formed the historic Samaritans. Among the most noted kings that had governed Israel during its prosperity were Jeroboam I, Jeroboam II, Ahab, Joram, and Pekah.

Judah was less powerful and prosperous than Israel. The kings of the house of David numbered 20, the most successful being Jehoshaphat, Uzziah, Hezekiah, and Josiah. These kings were the most devoted to the laws of Moses and the worship of Jehovah. This kingdom was invaded by armies from Egypt and Assyria and later became tributary to Babylon. In 586 Nebuchadnezzar captured Jerusalem and carried away its riches, making the leading citizens captives. Most important was the destruction of the Temple, the symbol of the unity and religion of the Jewish people.

It must be emphasized that in the realm of

Israel favorable and unfavorable times alternated frequently through these 300 years. We learn, for instance, about the wealth of the country under Omri and that then actually, although not politically, through commerce, intermarriage, and cooperation in wars, Israel and Judah were almost united again. But later on Jezebel, the wife of Ahab, the son of Omri, brought from Phoenicia the cult of Baal and from then on the continuous conflict between the Jewish religion and the Baal cult developed (see *Elijah*).

This, just one episode from the beginning of this 300 years before the destruction of the First Temple, is mentioned to prove that the history of these 300 years was by no means a story of continuous prosperity.

When Cyrus captured the throne of Babylon, in 538, he set the Jewish people free, after a captivity of about 70 years, restoring them to their former possessions, but made Judah a Persian province. Only about 42,000 Jews returned to the vicinity of Jerusalem in 538 and built the second temple in 516. Thus, as so often was true later on in Jewish history, each suppression, expulsion, exile led to the splintering away of certain parts of the Jewish people who assimilated themselves into foreign peoples and submerged gradually. In 458 Ezra, the priest, led a second return of exiles to Palestine in the reign of Artaxerxes, and Nehemiah was appointed Persian governor, under whose reign the walls of Jerusalem were rebuilt. More important is that Ezra and Nehemiah tried to renew the Mosaic laws and to purify the original Jewish monotheism. At that time probably the first congregation was formed, which collected the sacred books, developed the liturgy and articulated more especially the contents of Jewish religion. In the period between the return of Nehemiah and the fall of the Persian Empire, the Jews were Persian subjects, but this formed an epoch during which they enjoyed their own religious and educational institutions.

The main literary interests of Jewish civilization of this time were aimed more toward the past than toward contemporary happenings. The external fate of Palestine depended from now on entirely on what happened in and to Persia and Egypt, on their fights and on their revolutions. Judah was independent only as a religious community, led by the high priest of Jerusalem.

When Alexander the Great led the hosts of Grecian warriors into Asia, he penetrated toward the east and conquered the Persian Empire. In 332 B.C. the Jews submitted to him under promise that they be permitted to exercise freely their religious rites. After the empire founded by Alexander became divided, Palestine was made a possession of the Ptolemies of Egypt. About 100,000 Jews were taken to Alexandria and Cyrene and settled chiefly in the region from Libya to Ethiopia. Under a system of equal rights with the Egyptians they prospered. They aided in building the great schools and libraries of Alexandria and translated the Old Testament, this translation being known as the Septuagint, or Greek version.

About 198 B.C. a Syrian and an Egyptian party rose among the Jews of Palestine. This resulted in civil strife and finally brought on an invasion by Antiochus IV Epiphanes, King of Syria, in 170, which led to great slaughter and an effort to compel the Jews to change their religion. About this time the Maccabees attained power, and, after struggling 14 years, succeeded in driving the Syrians out and establishing the Sanhedrin, a national council.

In order to understand the impact of the Maccabean revolt, one must realize that during the last two centuries there had always existed within the Jewish people certain individuals and parties who leaned heavily on Egyptian and, later, on Greek civilization. Thus it was not the whole people who followed Judas Maccabeus and finally succeeded in erecting an independent Maccabean Judea. The Syrian army was defeated and finally in 165 the polluted Temple in Jerusalem was rededicated. Jewish religion had again become the center of Jewish national life. New parties arose after this had happened and the final result of all these struggles was that the Jews had their own religion and were even ruled by their own kings from 142 B.C. to 70 A.D.

The Jewish reign of this epoch is marked by the establishment of the Pharisees and Sadducees, two rival sects. The Pharisees represented the masses, in contract to the Sadducees who represented the hierarchic aristocracy. The Pharisees tried to break the control of the Temple priests and to make the people more independent of them. Logically, they strove for permission to execute within the Jewish home certain rites which had heretofore been executed only by the priests themselves within the Temple. A further consequence of their connection with the masses was their belief in a survival of the soul. This belief had taken root in the common people who during the last 300 years had come in contact with the religions of the surrounding peoples. These religions, as well as Hellenistic (*q.v.*) philosophy, contained this belief, and therefore it was only natural that the lower classes yearned for comfort in the other world when their life was rather miserable in this world.

Orthodox Judaism did not recognize this doctrine and therefore the Pharisees were considered by the Sadducees as heretics. Generally it must be said that the Pharisees fought for high ethical standards and that their characterization in the New Testament as hypocrites refers only to a small group of them and not to the whole sect. The aristocratic party of the Sadducees, the offi-

cial caste of priests, found their followers mainly among the wealthy and the old, aristocratic families. Their common bond was more that of social conservatism than one of religious orthodoxy.

Some of the Jewish kings went with the Sadducees, some with the Pharisees. A controversy between Hycranus II and Aristobulus over the title to the throne caused local disturbances and led the Pharisees, in 63 B.C., to ask aid of the Roman general Pompey, who made Palestine a Roman province. The Roman senate recognized Herod the Great as King of Judea (Roman name for Judah), who exercised sovereign prerogative in setting aside Jewish manners. Herod did everything to mollify the Romans. He levied high taxes and often contradicted the laws of the synagogue. Thus, more and more Jews became enemies of the Romans, revolts took place in Jerusalem, and finally Herod, who had before been only King of Galilee became, with the help of the Romans, King of Jerusalem. He was cruel toward his people and sometimes even toward his own family. On the other hand, it cannot be denied that he used his good relations with Rome in the interest of his people, that he erected magnificent monuments in and around Jerusalem, and tried to alleviate the economic conditions of the Jews. Within his reign, in 4 B.C., Christ was born at Bethlehem, and in 6 A.D. Samaria and Judea became a united Roman province, being governed by a procurator from Caesarea. Caesarea had been founded by Philippus, who ruled the country for 37 years. In 26 A.D. Pontius Pilate was made procurator, in whose reign Christ pursued his ministry and suffered death. Herod Agrippa, king in 41-44, persecuted the Christians, and caused the apostle James to suffer martyrdom. An insurrection occurred in 65 which resulted in the capture and destruction of Jerusalem five years later by Titus. Hunger and disease decimated the people and hundreds of thousands were led away as slaves. Hadrian razed it to the ground about 135 A.D. after quelling the last Jewish national revolution under Bar-Cochba (first wrongly greeted as the "Messiah") and erected a gentile city in its place, called Aelia Capitolina. He forbade the Jews under penalty of death to enter it, and not until the time of Constantine about 330 A.D. was the name of Jerusalem revived.

EMBROIDERED TORAH CURTAIN, 18th CENTURY

After the destruction of Jerusalem by Titus, the Jewish people became scattered extensively to all countries. Since that time they have lived either as aliens or as citizens by adoption. From the time of the destruction of the Temple until today the history of the Jews no longer represents political history but can be viewed only as a history of civilization and of culture. Periods of absolute suppression alternate with periods of slightly milder suppression, but there always existed certain individuals and certain groups which cultivated the Jewish heritage either in the form of deep religious fervor or in the more general form of contributing to the intellectual, spiritual, and artistic endeavors of mankind. In the time of Emperor Julian they made an unsuccessful attempt to build a new temple at Jerusalem.

During the course of the last three centuries before the destruction of Jerusalem, there had developed in Jerusalem an institution called the "Sanhedrin." This was the chief law-interpreting council in Palestine. After the destruction of Jerusalem, the Pharisaic scholars continued to meet as a Sanhedrin, and, when that institution ceased to function, they met in the form of "academies." The most important of these academies from the 3rd century until the 10th were those at Tiberias in Palestine, and the great Babylonian academies, one of which was established in Spura, the other first at Nehardea, and then in Pumpeditha. Among the celebrated works of their scholars is the Talmud (*q.v.*), completed in the year 500, which contains expositions of the Old Testament with additions and annotations. The ages-old intellectual schooling of the Jews, who have always been considered the "people of the book," drove them toward scholarly professions or leading business positions. They flourished intellectually alike in the countries of Christians and Moslems, though during the supremacy of the Moors in Spain their

learning and prosperity were greatest. In Central Europe during the Middle Ages the Jews were treated in a less friendly manner and from the 12th century on they were compelled in some towns and cities to live in segregated quarters, so-called ghettos (*q.v.*). In the 15th century Spain and Portugal required them to be baptized, to which they had to consent, or else be put to death, or be banished from the peninsula. In Germany Protestantism first helped to alleviate the situation of the Jews, but not for long. Jews were not allowed to join the guilds and special taxes were levied on them. Through the 16th and 17th centuries they were expelled from certain kingdoms, and this continued persecution went on until the middle of the 18th century. Then the French and German enlightenments contributed to at least a partial liberation of the Jews. Moses Mendelssohn (*q.v.*) fought for assimilation and spiritual connection with the Germans; the great German philosopher and writer, Johann Gottfried Lessing (*q.v.*), was his friend and shared his fight.

Modern History. At the beginning of the 19th century the various nations began to treat the Jews as regular citizens. Shortly after the French Revolution they were placed on an equality in France. Russia followed partially the lead of France in 1811, and Denmark did likewise in 1814. Great Britain admitted them to Parliament in 1858 and Norway sanctioned their immigration in 1860. Other countries modified their laws more or less in harmony with France and Germany, though disturbances have prevailed periodically, the most noted of recent times occurring in Russia in 1892 and in France in connection with the Dreyfus affair late in the 1890's. In the U.S. they have always had equal rights with other peoples. The tenacity with which the Jews of modern times cleave to the religion of their fathers among alien nations and peoples is remarkable.

Some of the greatest names in modern history are those of Jews, among them Spinoza, Rothschild, Disraeli, Mendelssohn, Heine, Meyerbeer, Karl Marx, Sigmund Freud, Albert Einstein, Paul Ehrlich, Henri Bergson, the painters Pissaro, Jozef Israëls, Chagall, Modigliani, the sculptor Jacob Epstein, the musicians Felix Mendelssohn, Camille Saint-Saens, Gustav Mahler, Max Bruch, Karl Goldmark, Arnold Schönberg, Kurt Weill, George Gershwin, and many interpreting musicians, including Rubinstein, Kreisler, Mischa Elman, Jascha Heifetz, Yehudi Menuhin, Bronislav Hubermann, Bruno Walter, etc.

Before Hitler entered the historical picture, there were about 17,000,000 Jews. Under Hitler's regime in Germany and German-occupied countries during World War II, however, a brutal persecution of the Jews was initiated. Many were transported en masse to ghettos in Poland and Czechoslovakia, where most of them were killed in gas chambers. The last reliable figures are dated 1959. Today, there is a total of about 12,000,000 Jews in the world, a decrease of about 5,000,000 since 1933. In Germany, the Jewish population before Hitler was about 600,000; today there are about 30,000 Jews in West Germany and 1,800 in East Germany. Poland had over 3,000,000 Jews prior to the war; today there are only about 41,000. In the Soviet Union, it is estimated that there are about 2,000,000 Jews, though exact figures have not been available. Other figures, based on 1959 estimates of the "American Jewish Yearbook" are—Austria, 11,000; England, 450,000; France, 350,000; Hungary, 100,000; Italy, 32,000; Rumania, 225,000; Spain, 3,000; Switzerland, 19,000; U.S., 5,250,000. In Asia, Iran has 80,000; Iraq, 5,000; Lebanon, 6,000; Syria, 5,500; Turkey, 60,000. There are about 560,000 Jews in Africa—Morocco, Algeria, Tunisia, Ethiopia, Kenya, Libya, Egypt, North and South Rhodesia, and the Union of South Africa. About 655,000 Jews live in South and Central America, 400,000 of them in Argentina. See *Israel; Palestine; Zionism.*

PRAGUE SYNAGOGUE

One of the oldest synagogues in Europe, the "Altneuschul," was started in the 10th century, but was later destroyed. The present structure, dating back to the 13th and 14th centuries, was erected in early Gothic style with two naves vaulted by pointed arches

Language. The Hebrew language is a branch of the Semitic family of languages. Perhaps originally it was the language spoken by the Phoenicians, and was adopted from those people by Abraham and his family at the time that patriarch

settled in Palestine. The religious and moral notions of all Hebrews caused many distinct characters to be impressed upon it, as also did the long residence in Egypt and the sojourn in the wilderness, thus making it a dialect distinct in many essentials. While the oldest sacred writings known to us are in the Hebrew, there are secular works and inscriptions coming to us from older sources. It is quite common to distinguish the language by two distinct periods, including the time up to the Babylonian exile, and from the exile up to the present. In the former period comparatively few foreign words were mixed with the language, while in the latter time many Arabian and Aramaic elements became incorporated. No material progress was made in securing a grammatical treatment of the language until about the 6th century A.D., when several technical texts were published. In the written language are many accents and marks of punctuation, but it has no capital letters. It has 22 consonants, five letters have a separate final form, and the vowels are designated by marks above or below the letters.

Yiddish is a mixed language of which about a quarter is derived from Hebrew words. A few words originated from the Slavic languages, while the main body of Yiddish is based on medieval German assimilated when the Jews emigrated from Germany to Poland. It is written in Hebrew letters but can easily be transcribed.

LITERATURE. The literature is of vast importance because of its wide influence on the Christian and Mohammedan nations. It surpasses the literature of all other ancient peoples on account of the vigorous style of its poetry and its religious characteristics, and at the same time is the most reliable source of the early history of the human race. The Bible (*q.v.*) is the greatest product of Jewish literature. No work of ancient or modern times has been read and studied with an equal interest and devotion, and its precepts have influenced human action more than any other works, either singly or collectively. Beginning with the Maccabean age, about 165 B.C., the Jews developed an oral interpretation of Scripture, which was later crystallized in a series of works, many of which have been preserved. These are known under the general name of Midrash (*q.v.*) meaning "interpretation." The Midrash is usually divided into two groups, the *halakic midrash*, which deals with matter of Jewish law, and the *aggadic midrash*, which deals with all other aspects of Judaism. Side by side with the Midrash, there developed also codified Jewish works of law, which about the beginning of the 3rd century were collected into a work known today as the "Mishna."

After the Mishna had been edited and prepared, it became itself the basis for further discussions in the Rabbinical academies. These discussions have been preserved in two monumental works: those of the Palestinian academies constitute the Palestinian Talmud; those of the Babylonian academies constitute the Babylonian Talmud.

During the period between 20 B.C. and 100 A.D., the most noted writers, outside the Rabbinic group, were Philo of Alexandria, who compiled various works of philosophy; Flavius Josephus, who wrote his famous "Antiquities of the Jews" and the "Jewish War"; and Jewish authors of parts of the New Testament.

In the period between 135 and 475 A.D., the schools of Palestine and Rome gave instruction from the "Halacha" and "Hagada." In this time the scholars versed in the "Mishna," the oral law, exercised a wide influence, and the "Talmud," containing the discussions of the "Mishna," was written. From this time on the Jewish people became widely scattered in many countries, thus causing them to acquire the language of the lands of their adoption. Many writers of modern nations are of Jewish extraction, the products being in various languages, and including works in philosophy, law, science, poetry, music, medicine, mathematics, philology, and higher criticism. See also *Judaism; Palestine; Zionism.*

Jew's-Harp (*jūz'härp*), a metallic musical instrument. The sound is produced by inhaling and ejecting air from the lungs, while the instrument is held between the teeth, the metallic tongue, or spring, being struck by the finger. Instruments of this kind are made wholly of steel. The sizes vary from small toys to those used to produce musical tones of considerable volume and in rhythmical order.

Jezebel (*jĕz'ē-bĕl*), Queen of Israel and wife of Ahab. She is noted for the evil influence she exercised in dishonoring Jehovah and introducing idol worship. Under her influence the Jews were persecuted until all but about 7,000 turned from the true God. She continued to exercise influence during the reign of her son Jehoram, but was killed by the command of Jehu, who caused her to be flung from the upper walls of the palace to the ground beneath, where she was mutilated by chariots and devoured by dogs.

Jhelam (*jē'lŭm*), or JHELUM, a large river of India, in the Punjab, one of the affluents of the Chenab. It rises in Kashmir, passes through the Himalayas in the defile of Barambula, and thence flows southward. It discharges into the Chenab River after a course of 490 m. The Jhelam is navigable for a distance of 300 m., and is noted for its fisheries.

Jidda (*jĭd'ä*), also spelled Jiddah and Jeddah, the chief trading port of the Hejaz section of Saudi Arabia. Located on the Red Sea, it is the seaport for inland Mecca. The 45-m. distance between the two cities is covered by a paved road.

Jidda is a walled city with six gates, three of which lead to the custom house and wharves which lie outside the town. Built largely of coral rock with ornate woodwork, the houses are quite picturesque. Although historically Jidda dates back many centuries, its commercial importance did not begin until the 15th century, when its location between India and Egypt made it a trade center. Captured from the Turks by the Hejaz kingdom in 1916, Jidda has since prospered. Its population, consisting of Arab, Persian, Indian, and Negro stock, numbers about 50,000.

Jigger (*jĭg'gẽr*), a kind of small flea. See *Chigoe.*

Jimson Weed (*jĭm'sŭn wẽd*) or THORN APPLE, a weedy plant distantly related to the nightshade family, naturalized all over the world. It grows from 2 ft. to 6 ft. high and has large trumpetlike flowers and green stems. Its leaves and seed yield the drug stramonium (*q.v.*); they are poisonous to man and domestic animals.

Jingoism (*jĭng'gō-ĭz'm*), a term applied to the philosophy of an individual or party advocating a warlike policy. The term jingoism was coined in 1877, when the political parties in England disagreed as to the policy of intervening in the war between Russia and Turkey. Gladstone and the Liberals advocated a neutral policy, while Disraeli and the Conservatives favored intervention to aid Turkey against Russia. The expression *by jingo* derives from a popular song of the period.

Jinnah (*jĭ'nä*), MOHAMMED ALI, statesman, born in Karachi, India, Dec. 25, 1876; died there, Sept. 11, 1948. After studying law, he became an advocate in the Bombay High Court (1897). He was made a member of the Imperial Legislative Council in 1910, and 10 years later took office as first elected president of the Moslem League. He again became president of the League in 1934, and retained that position until 1948. As the head of the All-India Moslem League, Jinnah was an important figure in Indian political life, and was chosen as the first governor general of the Dominion of Pakistan (established in 1947). He died a little more than a year after the birth of the nation he helped to found.

Jinrikisha (*jĭn-rĭk'ĭ-shä*), or JINRICKSHA, a light two-wheeled carriage drawn by a man, who runs between the shafts. It is mounted on springs, and is constructed to carry either one or two persons. Some are provided with a hood, which is attached to the upper part of the seat. The man who pulls the vehicle is called the *hiki.* Where long distances are to be covered or a heavy load is to be drawn, he is assisted by one or more outrunners, who pull by cords attached to the crossbar. The jinrikisha was invented in 1868 and was shortly after introduced in China, Japan, and India. See also *Carriage,* and color plate, *The Evolution of Land Transportation* in Volume XI.

Jitterbug (*jĭt'ẽr-bŭg*), a term applied to a form of social dancing that became popular with the advent of "swing" music, and to a devotee of such dancing. The various steps of jitterbug dancing stem basically from the "jazz age." The dance is semi-adagio in nature, and calls for highly energetic movements and gestures in time with the fast rhythms of "swing." Jitterbugging was popular with teen-agers for almost 20 years (1930-50), but began to fade out in 1950 when "hot" and "swing" music became less popular. See also *Dancing.*

Jiujitsu (*jōō-jĭt'sōō*), or JUJUTSU (also jujitsu and juijutsu), the art of unarmed self-defense and attack. It was first developed as a means of defense by Chinese monks whose order forbade them to use weapons, but late in the 12th century the Japanese became aware of the art and thereafter claimed it. The systems of jiujitsu were numerous and varied until 1882 when a Japanese professor, Jigoro Kano, who had studied all of the better systems, established a school. His system, known as Judo, became standard and was held a closely guarded secret until the Russo-Japanese War (1904-05). The art is now taught in the armies, navies, and police forces of most countries.

Applying knowledge of the weaker spots in the human anatomy to offense and defense, the system does not call for great physical strength. Its primary requisite is dexterity in the use of certain tricks, such as exerting great pain through light pressure by using the lever effect of leg or arm, or by pressing sensitive glands or nerve spots, and by bending the opponent's fingers. Among the best-known holds used in jiujitsu are the arm lock, the fly-

Courtesy Brown Bros., N. Y.

JAPANESE JINRIKISHAS

ing mare, strangulation, and the wrist lock.

Joab (*jō'ăb*), in the Old Testament, a celebrated Hebrew warrior, nephew of King David, who flourished in the days of Saul. David gave him command of the entire army, but he was soon replaced by Amasa. In revenge he killed Amasa under the guise of deception and joined in a rebellion with Adonijah, one of King David's sons and rival of Solomon for the throne. Later, he was captured by Solomon and slain at the temple, where he had sought safety.

Joachim (*yō'ä-ḳĕm*), JOSEPH, violinist, born near Pressburg, Hungary, June 28, 1831; died in Berlin, Germany, Aug. 15, 1907. He studied music at Budapest and in 1843 appeared in concert at Leipzig, where he remained to study music, principally under Felix Mendelssohn-Bartholdy (*q.v.*). In 1849 he began to perform before various courts in Europe, and for several years made annual appearances in London. He was made concert master of the court orchestra of Weimar in 1849, under Liszt, and in 1868 was made head of the Berlin Acad. of Music, where he proved his ability as a teacher. As a violinist of extraordinary technique, he interpreted music, and he is also notable as a composer. The Joachim Quartet, which he founded in 1869 and in which he played the first violin, was one of the most outstanding chamber music ensembles of the 19th century.

Joachim (*jō'ä-ḳĭm*), SAINT, in the New Testament, father of the Virgin Mary and the husband of St. Ann.

Joan of Arc (*jōn' ŭv ärḳ*), Maid of Orléans, French heroine, born in the village of Domremy, now in the department of the Vosges, France, Jan. 6, 1412; executed May 30, 1431. She was descended from humble parents, obtained a rudimentary education, and learned to spin, sew, and do household duties. The protracted wars between France and England gave her much concern. At 13 she began to see heavenly visions of saints who impressed her with the belief that she was divinely chosen to assist the French dauphin. It was not until several years later, however, that she succeeded in interviewing the prince. Her pious enthusiasm persuaded those in authority to give credence to the heavenly vision and angelic voices. After donning male attire and equipping herself with a sword and a sacred banner, she proceeded with Count de Dunois to bring about the deliverance of Orléans. An army of 10,000 men was placed at her disposal, with which she entered Orléans on April 29, 1429. Her superb leadership inspired the French with confidence, and, after successive and well-directed attacks, they forced Suffolk to abandon the siege of Orléans on May 8, 1429. Joan at once became the heroine of the French and the dread of the English. Numerous sucesses followed at Orléans, and shortly afterward she conducted Charles to Rheims, where he was anointed and crowned king, on July 17, Joan occupying a position of honor at his side.

Joan of Arc wished to return home after this coronation, but Charles induced her to remain with the army. In the attack on Paris, she received a slight wound, but continued aggressive action until May 25, 1430, when she was taken prisoner by the Burgundian forces in Compiègne, and sold to the English for $3,200. The latter took her to Rouen and subjected her to a long trial. The judging tribunal was composed of French theologians led by the prosecutor, Cauchon. On May 23, confused and bewildered by the painful, long-drawn-out hearing, Joan signed an abjuration and was subsequently given a life sentence. The English, disappointed at the "leniency" of this judgment, and desiring to have it reversed, brought pressure to bear upon Cauchon, who, construing Joan's defiant wearing of male apparel in prison as a "relapse," pronounced the death penalty. Joan was publicly burned on May 30, 1431, and her ashes were thrown into the Seine River. A court constituted by Pope Calixtus III in 1456 declared her innocent and pronounced her trial unjust. In French history and in the history of civilization she ranks as a heroine and martyr. Beatified by Pope Pius X in 1909, she was canonized by Pope Benedict XV in 1919, May 8 being her feast day.

Courtesy French Press & Information Service, N. Y.
JOAN OF ARC
After a 15th-century painting

Joash (*jō'ăsh*), or JEHOASH, King of Judah, who reigned for 40 years, from 836 until 796 B.C. He was a son of Ahaziah by Athaliah. At first he reigned under the regency of his mother. In the beginning he instituted religious reforms, but later reverted to idolatry. He was succeeded by his son Amaziah. Another Joash, a King of Israel, succeeded his father Jehoahaz in 797 and reigned until 783 B.C. Like his father, he followed Baal-worship. As a warrior he is noted for courage and activity.

Job (*jōb*), meaning the hated or afflicted, the hero of the Book of Job, which forms a part of the Old Testament. Whether Job was a real personage or the hero of a poem or drama in a similar sense as *Shylock* in Shakespeare was real is a question which scholars are unable to decide and upon which there is a diversity of opinion. Where the Book of Job was written and who wrote it is not known. The Book of Job is a production intended to widen the conception of the providence of God. It sets before men a new view of suffering and trial, in which it was possible for a man like Job to remain true to his trust, and look beyond to another life where God will vindicate such trust. It is represented that Job lived in a region between Palestine and the Euphrates known as the land of Uz, and his life presents a remarkable steadfastness in fidelity to Jehovah through suffering and affliction.

Job's Tears (*jōbz tērz*), the name of a grass native to India, grown as a cereal in a manner similar to corn. It is so named from the seeds, which are tearlike, hard, shining globules. The seed is used in India for food. The plant has been naturalized in Canada and the U.S. as an ornamental grass.

Jodhpur (*jōd-pōōr'*), or MARWAR, a native state in Rajputana, India. The largest of the 21 Rajput states, it is governed under the Western Rajputana Agency. Capital, Jodhpur (population, *ca.* 70,000). Area of the state, 36,071 sq. m. Population, over 2,000,000.

Jodhpurs (*jōd'pōōrz*), riding breeches of the style worn originally by British army officers in India. The name derives from the Rajputana province of Jodhpur. Jodhpurs are tight-fitting below the knee. They are not encased within boots, but are worn on the outside of low, ankle-high boots.

Joel (*jō'ĕl*), one of the 12 minor prophets, who delivered his predictions in or about the time of Joash, and after the exile dwelt in the vicinity of Jerusalem.

Joffre (*zhôf'r'*), JOSEPH, general, born at Rivesaltes, France, in 1852; died Jan. 3, 1931. He studied in his native town and at the Ecole Polytechnique in Paris, where he excelled as a student of military affairs. In 1870 he was an engineer in the Franco-Prussian War, building fortifications at Paris, and subsequently was professor of fortifications at Fontainebleau. He commanded in Africa in 1893 and in 1911 was made commander-in-chief of the armies of France, in which position he achieved great successes (1914-16) during World War I. He came to America in 1917 to aid in securing co-operation among the allied countries, touring westward as far as St. Louis.

JOSEPH JOFFRE

Johannesburg (*jō-hăn'ĭs-bûrg*), the largest city in the Union of South Africa, in the Transvaal Province, 35 m. s. of Pretoria. It is the headquarters of Union Railways and the Harbors and Airways Admin. and has modern airport facilities. The largest commercial and industrial center in South Africa, it is the richest gold-mining area in the world, being surrounded by the Witwatersrand gold fields. The principal industries are metal- and wood-working, textile milling, diamond cutting, and the manufacture of machinery, chemicals, drugs, furniture, and clothing. Noteworthy buildings include the stock exchange, the Municipal Art Gallery, the Geological Museum, the public library, the Africana Museum, and the Anglican cathedral. It is the seat of the Univ. of Witwatersrand; Witwatersrand Technical Coll.; the South African Inst. of Medical Research; the Union Observatory (including the telescope of Leiden Univ., The Netherlands); and the Yale-Columbia Southern Station Observatory.

Johannesburg was founded as a mining settlement in 1886 by the Boers (South Africans of Dutch descent). Friction between the Boers and the British erupted in the South African War (1899-1902), and Johannesburg was captured by British forces in 1900. It became a city in 1928. Population, 1951, 884,007.

John (*jŏn*), SAINT, one of the 12 apostles, called THE EVANGELIST and THE DIVINE, son of Zebedee (Matthew 4:21). He and his brother James became disciples (Mark 1:19, 20)—John becoming the disciple Jesus loved (John 13:25; 19:26).

Courtesy The Metropolitan Museum of Art, Rogers Fund, 1956

ST. JOHN THE EVANGELIST

His Vision of the Mysteries of the Apocalypse, an oil painting by El Greco (1541-1614)

John was at the Crucifixion (John 19:26), where Jesus commended His mother to his care (John 19:27). He stayed in Jerusalem until the Apostolic Council (49-50), and then he went to Ephesus, his permanent see after 69. He was exiled to Patmos (Revelation 1:9) during the reign of Domitian (81-96) and there wrote the Apocalypse (*q.v.*), or "The Revelation of Saint John the Divine." Returning to Ephesus in 96, he wrote his Gospel (the fourth) and three Epistles before his death (*ca.* 100). The date of his death is in dispute, some Biblical scholars placing it at *ca.* 60, thus disputing as well the apostolic authorship of the Apocalypse and the Gospel.

John, SAINT, prophet and cousin and forerunner of Christ, called THE BAPTIST, born *ca.* 5 B.C.; died *ca.* A.D. 30. His birth, to the priest Zacharias and Elizabeth, was miraculously foretold (Luke 1:13). This and other incidents of his life are related in the New Testament. He devoted his life to preparing the people for the coming of the Messiah (Matthew 3:11). John derived his name from baptizing Christ (Matthew 3:15) and many others in the Jordan. After publicly rebuking the wife of Herod Antipas, tetrarch of Perea and Galilee, he was beheaded at her and her daughter Salome's insistence (Matthew 14:8-11; Mark 6:17-28).

John, the name of 21 popes, an antipope (John XVI), and a schismatic (John XXIII). The first Pope John began his reign in 523; the current, John XXIII (*qq.v.*), began his reign in 1958. The most noteworthy are John I, John VIII, John XXII, John XXIII, and the schismatic pope John XXIII.

John I, SAINT, pope from 523 to 526, born in Tuscany, *ca.* 470; died May 18, 526. In 525 he led a delegation to Justin I, Byzantine emperor, seeking toleration for the Arians. The mission being only partly successful, John I was suspected of treachery by Theodoric, king of the Ostrogoths, and placed in prison, where he died. For this martyrdom, he was later elevated to sainthood. His feast day is May 27.

John VIII, a Roman, was pope from 872 to 882, succeeding Adrian II. He was a strong pope who did much to unite the states of southern Italy against the Saracens and to root out corruption in the Church.

John XXII (JACQUES D'EUSE), pope at Avignon from 1316 to 1334, born in Cahors, France, *ca.* 1249; died in Avignon in 1334. Like his predecessor, Clement V, John claimed papal sovereignty over the Holy Roman Empire. This provoked the Emperor Louis IV into setting up an antipope, Nicholas V, in Rome (1328). Louis' project failed, but he did silence John's extreme claims of authority.

John XXIII (BALDASSARRE COSSA), a schismatic pope (1410-15), born in Naples, Italy, *ca.* 1370; died in 1419. He had a military career before Pope Boniface IX made him a cardinal (1402). In 1408 he deserted Pope Gregory XII and helped set up the Council of Pisa to end the Great Schism between the popes of Rome and Avignon. The council declared both Gregory XII and Benedict XIII deposed and set up a third claimant, Alexander V, who died a year later. Cossa succeeded him as John XXIII, with the largest following of the three popes. He was deposed at the Council of Constance (1415), and held prisoner in Germany until 1418. When he returned to Italy, the

Courtesy National Gallery of Art, Wash., D.C.

ST. JOHN THE BAPTIST

Bust by Donatello (1386-1466)

Wide World Photo

POPE JOHN XXIII
The pontiff gives his first papal blessing

Courtesy British Information Services

SIGNING OF THE MAGNA CARTA
The reluctant king meets with his barons at Runnymede

legitimate pope, Martin V (who had healed the schism in 1417), forgave him and appointed him cardinal bishop of Tusculum. He died shortly thereafter.

John XXIII (ANGELO RONCALLI), pope (1958-63), born in Sotto il Monte, Italy, Nov. 25, 1881; died in Vatican City, June 3, 1963. Son of a farmer, he entered the seminary in Bergamo at the age of 11. In 1904 he was ordained and became secretary to the bishop of Bergamo. He was a chaplain in World War I and later organized missionary work. Made a titular archbishop in 1925, he served for 19 years as a diplomatic representative of the Vatican in Bulgaria, Greece, and Turkey and (1944-53) as papal nuncio to France. Elevated to cardinal in 1953, he was patriarch of Venice until his election as pope on Oct. 28, 1958. In his brief reign John had a great impact on the Church and on the world, impressing all with his gentleness, tact, and understanding. His efforts toward peace were highlighted by the encyclical *"Pacem in Terris"* (1962). He broke many papal traditions. He left the Vatican frequently to visit shrines, hospitals, and schools. He received in audience such diverse non-Catholics as Geoffrey Francis Fisher, archbishop of Canterbury; and Alexei I. Adzhubei and his wife, son-in-law and daughter of Soviet Premier Nikita S. Khrushchev. The crowning achievement of his reign was the convocation of Vatican Council II, the conclusion of which he did not live to see (see *Ecumenical Council*).

John, the name of eight Byzantine emperors who ruled (as indicated below) within the period 969-1448. John II (1118-43) recovered domination of the seacoast of Asia Minor, and the empire regained much power. John III (1222-54) extended his territory in Asia Minor but failed to take Constantinople. His reign was marked by economic prosperity and military power. The throne of John V (1341-76, 1379-91) was usurped during his minority by John VI (1347-55), and later by his son Andronicus IV (1376-79). In an effort to recruit Western aid against the encroachment of the Turks, John V went to Rome and became a Latin Catholic, but he was forced later to acknowledge the authority of the Ottoman sultan Murad I. John VI, aided by the Ottoman Turks in his skirmishes with John V, is blamed historically for the entrance of the Turks into Europe. John VIII (1425-48), his empire reduced to Constantinople, sought Western aid by agreeing (1439) at the Council of Florence to a union of the Churches of East and West.

John, king of England, youngest son of Henry II, born in Oxford, England, Dec. 24, 1167; died in Newark-on-Trent, Oct. 18, 1216. He was nicknamed Lackland because he did not receive any portion of the royal possessions at first, although he later was given dominions and the lordship of Ireland. His weak rule in Ireland led to his recall in 1185, and in 1189 he joined his brother Richard I (*q.v.*) in a conspiracy against their dying father. Richard, crowned in 1189, gave John further lands and titles and soon left on the Third Crusade, appointing his nephew, Arthur of Brittany, as his heir. In an effort to seize the throne, John had himself acknowledged (1191) temporary ruler and, when Richard was captured (1192) by Duke Leopold of Austria, he conspired to prolong his brother's captivity. Richard returned in 1194 and forgave John, and when he died (1199) left John the throne. It is believed that Arthur was murdered (1203) on John's orders.

Tyrannical, cruel, and treacherous, John reigned in a manner that alienated both the Church and the barons. His refusal to accept the election (1206) of the archbishop of Canterbury led Pope Innocent III to excommunicate him (1209) and to invite Philip II (*q.v.*) of France to invade England and depose him. John submitted to the pope in 1213 and surrendered England to him, receiving it back as a fief. He incurred the wrath of the barons by abusing feudal customs and extorting money from them (which

his predecessors, Henry II and Richard I, had also done). The barons joined together and on June 15, 1215, forced him to sign the Magna Carta (*q.v.*), the greatest document of English constitutional history. With papal support, John renewed the fight with the barons, but he died in the middle of this campaign.

John II (JOHN THE GOOD), king of France, born in 1319; died in London, England, April 8, 1364. Five years after he succeeded (1350) his father, Philip VI, hostilities broke out between France and England in a renewal of the Hundred Years War (*q.v.*) that involved the two countries periodically from 1337 to 1453. John was captured (1356) by the English at the battle of Poitiers (*q.v.*) and sent to England. When his ransom was fixed, he returned to France, but, unable to raise the amount, he went back to England voluntarily in 1364 and soon afterwards died there.

John I (JOHN ZÁPOLYA), king of Hungary, born in 1487; died in 1540. He became a leading contender for the throne by winning an edict at the Diet of 1505 which restricted candidates for king to natives of Hungary. He was appointed voivode (liege prince) of Transylvania in 1511, and three years later he stamped out a peasant uprising with great brutality. When the king, Wladislaus II, died (1516), John was named governor to the infant king Louis II and, when Louis was killed in battle later, John was crowned (1526). A rival candidate, Ferdinand I, claimed the throne by right of his marriage to Wladislaus' daughter, but he eventually recognized John when he was assured the right of succession. John revoked this right shortly before his death, when his son, John II, was born (1540).

John II (JOHN SIGISMUND ZÁPOLYA), king of Hungary, born in 1540; died in 1571. His father, John I, who died in 1540, placed him under Turkish protection. Crowned as an infant, he was also made prince of Transylvania when Sultan Suleiman I occupied (1541) the capital, Buda (which remained in Turkish hands for 150 years). During John's reign, the diet adopted (1564) Calvinism as the state religion.

John II, king of Poland, son of Sigismund III, born on March 21, 1609; died in Nevers, France, Dec. 16, 1672. In 1648 he succeeded his stepbrother Ladislaus IV and renounced the monastic vows he had taken earlier. His turbulent reign, known as "the Deluge" in Polish history, was marked by several wars against Russia and Sweden and by internal disorders in the diet. He abdicated in 1668 and retired to an abbey at Nevers.

John III (JOHN SOBIESKI), king of Poland, born in Oleska, Galicia, June 2, 1624; died on June 17, 1696. He was appointed (*ca.* 1668) commander of the Polish army, and in 1673 he defeated the Turks at Khotin. When King Michael died in 1674, Sobieski was elected his successor. Recognizing the Turkish threat to Europe, John allied himself with Leopold I of Bohemia and Hungary, and in 1683 he led a combined army to victory over the Turks besieging Vienna. He pursued the Turks into Hungary and ultimately freed that country from Ottoman control. His last campaign (1684-91), to gain access to the Black Sea, was unsuccessful, and his last years were plagued by political and domestic intrigues. His death, followed by the election of a king from Saxony, marked the end of Polish independence.

John I (JOHN THE GREAT), king of Portugal, illegitimate son of Pedro I (*q.v.*), born in Lisbon, April 22, 1357; died Aug. 11, 1433. The death (1383) of his brother, Ferdinand I, without male issue precipitated a controversy over the throne, and John was not recognized until two years later. In 1385 the king of Castile invaded Portugal, meeting defeat at the hands of John's army at the battle of Aljubarrota. In 1415, warring with the Moors, he annexed Ceuta in North Africa. John's reign, one of the most productive in Portuguese history, heralded the first flowering of Portuguese literature and the birth of colonial and maritime expansion.

John II (JOHN THE PERFECT), king of Portugal, born in Lisbon in 1455; died in October 1495. He succeeded his father, Alfonso V, on the throne of Portugal in 1481. An astute politician, he contrived to curtail the power of the nobility by bringing about the death of the dukes of Braganza and Viseu, two prominent aristocrats. In the rivalry between Portuguese and Spanish colonial expansion, he signed the treaty of Tordesillas (1494), which adjusted territorial disputes. He encouraged voyages of discovery, particularly seeking a sea route to India (although he would not aid Columbus, whom he regarded as too idealistic). During his reign, Diego Cam discovered the Congo and Bartholomeu Dias (*q.v.*) rounded the Cape of Good Hope. But the greatest discovery in Portuguese history, the voyage of Vasco da Gama (*q.v.*) to India (1497-99), was made shortly after his death.

John VI, king of Portugal, born in Lisbon, Portugal, *ca.* 1769; died there, March 10, 1826. Son of Peter III and Maria I, he assumed control of the government in 1792 when his mother became insane. He was made regent in 1799 and became king after his mother's death (1816). Opposing the French Revolution, John aided England against France, thus angering Napoleon. He was defeated (1801) by French-Spanish forces, and remained submissive to Napoleon until 1807 when, on hearing the French were marching against Portugal, he fled to Brazil and set up his court there. He had left great unrest behind him, which culminated in the revolution of 1820 and the proclamation of a constitutional government.

John then returned to Portugal and swore allegiance to the new constitution. In 1825 he recognized Brazil's independence.

John, AUGUSTUS EDWIN, painter, born in Tenby, Wales, Jan. 4, 1878; died in Fordingbridge, England, Oct. 31, 1961. He studied at the Slade School of Fine Art, University Coll., London. A draftsman of unusual power, he worked in the tradition of Rembrandt Harmensz van Rijn and El Greco (*qq.v.*). Among his portraits are those of William Butler Yeats, George Bernard Shaw, and Sean O'Casey. He was the official artist of the Canadian forces in Europe during World War I, and he made portraits of the chief figures of the Paris Peace Conference (1919), notably one of Prime Minister David Lloyd George. In his earlier years, John also made etchings; he began sculpture at the age of 74. Elected to the Royal Acad. in 1928, he resigned in 1938 and was reelected in 1940. He was awarded the Order of Merit in 1942. His "Chiaroscuro: Fragments of Autobiography" was published in 1952. See *Joyce, James,* for an example of John's art.

John Bull, symbolical personification of the English nation, probably derived from a figure in "The History of John Bull," a collection of five pamphlets by John Arbuthnot (1667-1735). The pamphlets, begun in 1712, satirized Whig war policy and appeared in "Miscellanies in Prose and Verse" (1727).

Courtesy Bettmann Archive, N. Y.

JOHN BULL
After a drawing by Thomas Nast (1840-1902)

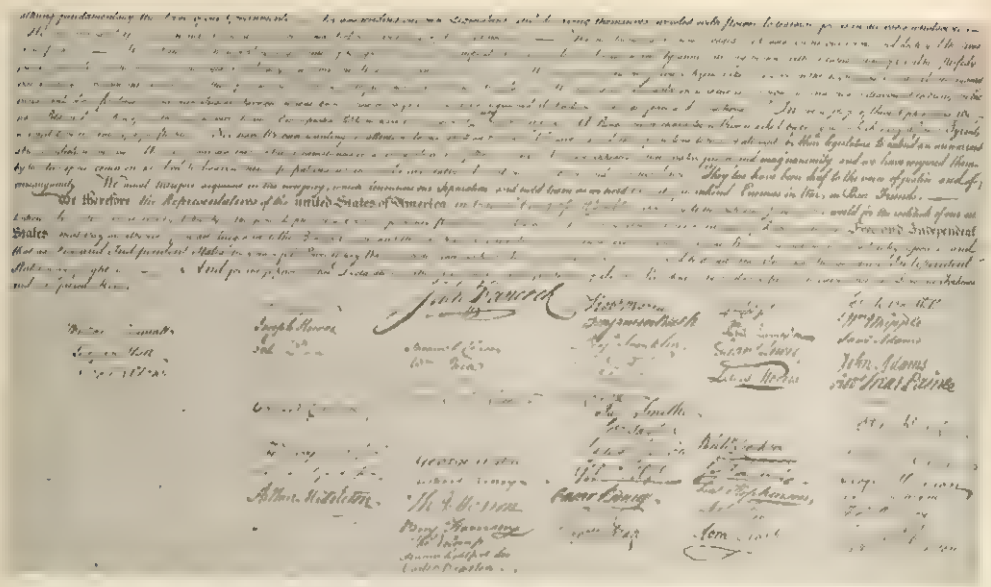
John Chrysostom (*krĭs'ŭs-tŭm*), SAINT, Greek Church Father, born in Antioch, Asia Minor, *ca.* 345; died in Comana, Sept. 4, 407. His early studies were at the school of Libanius, the sophist, where he demonstrated his mental power and love of classical culture. He was baptized (*ca.* 370) and retired to the desert to study. Illness forced his return, and he was ordained a deacon in 381 and a priest in 386. In 398 he was named bishop of Constantinople, but his attacks on the immorality of the court enraged Emperor Arcadius, who had him removed to Armenia, and then to a still more isolated spot on the Black Sea. He died en route in Asia Minor. His exile caused a schism, and his followers, known as Johannists, returned to the Greek Church only after his relics were brought back (*ca.* 438). His most popular writings are "On Priesthood," "On the Statues," "On Genesis," and "On Psalms."

John Day, a river in northeastern Oregon, having several branches. It flows west and north into the Columbia River. It is *ca.* 281 m. long and is used for power and irrigation in the Columbia River valley development.

John Dory, a fish found in European bays, often prized for eating. It has an extremely compressed body (it is practically invisible when viewed head-on) and a large mouth which is capable of rapid protrusion. It is greedy, feeding on mollusks, shrimp, and other fish, engulfing the victim with its protruding underjaw. According to legend, a prominent dark spot on its side is the fingerprint Peter made when he took tribute money from it (Matthew 17:27).

John Frederick I, elector of Saxony, born in Torgau, Saxony, June 30, 1503; died in Jena (or Weimar), Thuringia, March 3, 1554. He succeeded his father, John the Steadfast, in 1532. A year earlier, he had formed the Schmalkaldic League with Philip of Hesse and other princes to defend Protestantism against Emperor Charles V. In 1546 war broke out between the emperor and the league, culminating in the battle of Mühlberg (1547), in which John Frederick was captured. He renounced the electorship in favor of his cousin Maurice, duke of Saxony, and was held captive until 1552.

John George I, elector of Saxony, born in Dresden, Saxony, March 5, 1585; died there, Oct. 8, 1656. In 1611 he succeeded his brother, Christian II. During the Thirty Years' War (*q.v.*), he fought on both sides. He took part in driving Frederick V from Bohemia, thus crushing Protestantism in that country. Gradually his policy turned toward the Protestant side, and, when the imperial troops of Emperor Ferdinand ravaged Saxony, he made an alliance (1631) with Gusta-



A NAME THAT ADDED A TERM TO THE LANGUAGE

John Hancock's signature stands out boldly among the many on the American Declaration of Independence

vus Adolphus of Sweden and captured Prague. He later engaged in a war against Sweden and was defeated (1636) at Wittstock. A truce (1645) with the Swedes ended Saxony's role in the Thirty Years' War.

John Hancock, colloquial for a signature. The expression is derived from the extraordinary legibility of the signature of John Hancock (*q.v.*), a signer of the Declaration of Independence.

John Henry, a legendary Negro hero (*ca.* 1870) in the ballads and tall tales of the South. He was sometimes a steel driver and sometimes a roustabout on river boats, and his chief exploit was his race with a steam drill in driving steel. He finished ahead of the machine but died from exertion. Variants of the ballads were collected in "John Henry: Tracking Down a Negro Legend" (1931), by Guy B. Johnson. Roark Bradford combined the tales in "John Henry" (1931).

John Maurice of Nassau, colonial administrator, born in Dillenburg, Prussia, in 1604; died in Cleve, Dec. 20, 1679. In 1636 the Dutch West India Co. appointed him governor general of its newly acquired lands in Brazil. He extended the Dutch holdings in northern Brazil and took several Portuguese possessions on the west coast of Africa. The colony flourished under his administration, but his plans for rebuilding were considered too extravagant and he was recalled in 1643. On his return to Europe he held several commands in the Thirty Years' War (*q.v.*), and after the peace of Münster (1648) he governed Cleve, Mark, and Ravensberg for the elector of Brandenburg. In 1652 he was made a prince of the Holy Roman Empire. He returned to Holland in 1664, and when war broke out with England he was made commander in-chief of the Dutch land forces. He retired to Cleve in 1675.

Johnny Appleseed (*jŏn'ĭ ap''l-sēd*). See *Chapman, John.*

John of Austria (*jŏn*), DON, military leader, born in Regensburg, Bavaria, Feb. 24, 1547; died in Namur, Belgium, Oct. 1, 1578. He was the natural son of Emperor Charles V, who provided for him in his will, and the half-brother of Philip II, who recognized him as a member of the royal family. Philip intended Don John for the church, but the latter preferred a military life, and in 1570 he held a command in an expedition against the Moors, who had rebelled in Granada. In 1571, as admiral of an alliance formed by Pope Pius V, Spain, and Venice, he defeated the Turks in the naval battle of Lepanto. Two years later he took Tunis, and he served as governor general of Italy. In 1576 he was appointed governor general of the Netherlands to subdue the revolt against Spanish rule led by William of Orange (William the Silent). He was obliged to make concessions to William, set forth in the Perpetual Edict of 1577, but he soon resumed hostilities, defeating William in 1578. He died shortly thereafter.

John of Brienne, king of Jerusalem, born *ca.* 1148; died in March 1237. He married (1210) the daughter of Isabella of Jerusalem, and when she died he became regent (1212) for their daughter, Yolande. He was active in the Fifth Crusade (1218-21). He arranged the marriage (1225) of his daughter and Emperor Frederick II, who promptly claimed the throne of Jerusalem for himself. John avenged himself by fighting for the papal armies in Italy against Frederick. In 1228 he was named regent of Constantinople, and he successfully defended the city (1236) against the forces of John III of Nicaea and Ivan II of Bulgaria.

John of Damascus, SAINT, theologian, born

ca. 676; died *ca.* 750. His childhood was spent at the court of the caliph in Damascus, where his father held an official position. He inherited his father's office but later resigned (*ca.* 726) to enter a monastery in Jerusalem. He spent most of his life championing the cause of orthodoxy against iconoclasm, maintaining that image worship is the highest form of belief. His reputation is based largely on "The Fountain of Wisdom," a standard work on the dogma of the Eastern Church.

John of Gaunt (*gänt*), duke of Lancaster, born in Ghent, Belgium, in March 1340; died in London, England, Feb. 3, 1399. Son of Edward III of England, he became duke (1362) by right of his first wife, Blanche of Lancaster, acquiring thereby extensive lands and power. Serving under his brother, Edward the Black Prince, in the Hundred Years' War (*q.v.*), he went on the victorious campaign to aid Peter the Cruel, king of Castile, and he married Peter's daughter in 1369. When the Black Prince was taken ill, John became commander in chief in France. After a truce was reached, he returned to England and acted as viveroy for the aged Edward III, who died in 1377. He was very unpopular; he dissolved the "Good Parliament" in 1376 and handpicked his own Parliament in 1377. His power declined after the crown passed to Richard II, son of the Black Prince, who had died in 1376. In 1386 he led an expedition to Castile to claim the throne by right of his second wife, but he later relinquished his claim in favor of his daughter and her husband, Prince Henry of Castile. He returned to England in 1389. In 1396 he married his third wife, Catherine Swynford; their descendants comprised the Tudor line. His eldest son later became Henry IV, first of the royal line of Lancaster.

John of Leiden (*lī'dĕn*), religious leader, born in Leiden, the Low Countries, *ca.* 1510; died in Münster, Germany, Jan. 23, 1536. In 1533 he joined the Anabaptists, the left-wing faction of the Reformation, and moved to Münster. The next year the Anabaptists deposed the civil and religious leaders and set up their own theocracy. When their leader, Johann Matthiesen, was killed in battle, John assumed the crown of the new Kingdom of Zion. During his brief reign, he communized property and legalized polygamy. The expelled bishop of Münster returned victoriously in 1535, and John was executed (1536).

John of Luxemburg, king of Bohemia, born *ca.* 1296; died at Crécy, France, Aug. 26, 1346. The son of Emperor Henry VII, he became count of Luxemburg in 1309 and in 1310 was chosen king of Bohemia, having married the daughter of a former king. He distinguished himself in many wars and died heroically at the battle of Crécy, where he had joined his ally Philip VI of France against the English. Although blind, he asked that his horse be led into battle, and he was killed.

John of Salisbury (*sąlz'bĕr-ĭ*), philosopher, author, and bishop, born in Salisbury, England, *ca.* 1115; died in Chartres, France, Oct. 25, 1180. He studied with Abelard in Paris (1136), and in 1150 became secretary to Theobald, archbishop of Canterbury. After Theobald died in 1161, he continued as secretary to Thomas à Becket and was present at his assassination. He was made bishop of Chartres in 1176. His two main works are "Polycraticus" (1159), on the principles of government, and "Metalogicus" (1159), about the intellectual life of his age.

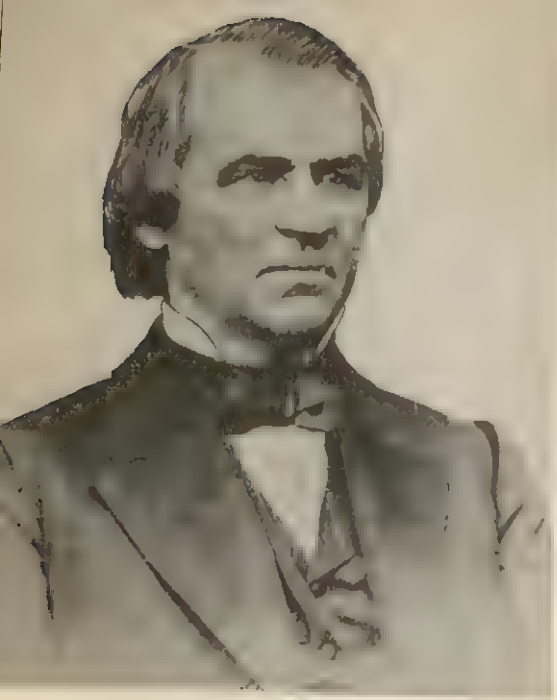
John of the Cross, SAINT, Spanish mystic, born in Fontiveros, Spain, June 24, 1542; died in Ubeda, Spain, Dec. 14, 1591. He studied under the Jesuits, entered the Carmelite order, and was ordained in 1567. Founder of the Discalced Carmelites, he was a close friend of St. Theresa of Ávila and followed her reforms. He wrote poems of lyric mysticism, among them "Ascent of Mount Carmel," and "Dark Night of the Soul."

John Scotus (*skŏ'tŭs*). See *Duns Scotus, John.*

Johns Hopkins University (*jŏnz hŏp'kĭnz ū-nĭ-vĕr'sĭ-tĭ*), an institution of higher learning located in Baltimore, Md., chartered in 1867. The first classes were offered in 1876, and the famous medical school, which is associated with the Johns Hopkins Hospital (1889), was opened in 1893. The university is famous for its laboratory and research work. Milton Eisenhower has been president since 1956.

Johnson (*jŏn'sŭn*), ALLEN, historian, editor, born in Lowell, Mass., Jan. 29, 1870; died in Washington, D.C., Jan. 18, 1931. An Amherst graduate (1892), he received his Ph.D. in 1899 at Columbia Univ. and then taught history at Iowa (now Grinnell) Coll. (1898-1905) and at Bowdoin Coll. (1905-10). He was professor of American history at Yale Univ., 1910-26. He edited the 50-volume "Chronicles of America" (1918-21) and resigned from the Yale staff in 1926 to become the first editor (1926-31) of the "Dictionary of American Biography." His historical works include "Stephen A. Douglas" (1908), "Jefferson and His Colleagues" (1921), and "The Historian and Historical Evidence" (1926).

Johnson, ALVIN SAUNDERS, educator, economist, born near Homer, Nebr., Dec. 18, 1874. He was professor of economics at Cornell Univ. (1912-16) and professor of political science at Stanford Univ. (1916-18). He edited (1917-23) the *New Republic* and in 1927 became associate editor of the "Encyclopedia of Social Sciences." He was director (1923-45) of the New School for Social Research, New York, N.Y. His later writings include "The Public Library: A People's University" (1938), "The Clock of His-



Courtesy Brown Bros., N. Y.

ANDREW JOHNSON

tory" (1946), and "The Battle of the Wild Turkey, and Other Tales" (1961).

Johnson, AMY, aviator, born in Hull, England, 1903; died in 1941. She became a pilot in 1928, receiving an Australian license two years later. She was the first woman to fly alone from London to Australia (1930). The following year she broke the record for a solo flight from England to India, making the flight in six days, and covering the distance from London to Tokyo in 10½ days.

She married Capt. James A. Mollison in 1932 (divorced, 1938), and in 1933-34 they made record flights from England to the U.S. and to India. Her last great solo venture was in 1936, when she made a round trip flight to Cape Town, South Africa. She was drowned during World War II while on flying duty with the British Auxiliary Air Forces.

Johnson, ANDREW, 17th President of the U.S., born in Raleigh, N.C., Dec. 29, 1808; died July 31, 1875. His father, Jacob Johnson, died from injuries received while rescuing a person from drowning when Andrew was four years old. Since his parents were very poor, his early education was scanty. He learned the alphabet from a fellow-workman, while apprenticed to a tailor, at the age of 10 years, and succeeded in borrowing a book from which he learned to read. In 1824 he removed to South Carolina, where he worked as a journeyman tailor, and in 1826 settled at Greeneville, Tenn., where he married Eliza McCardle, a woman of refinement, who taught him in the evenings to write and instructed him in the elements of arithmetic while at work during the day.

His remarkable natural tact and ambition to learn enabled him to make material advancement, and he soon became a political leader. An organized party of workmen elected him alderman in 1828, and in 1830 he was elected mayor, which office he held three years. In 1831 he was made trustee of Rhea Acad., and aided in organizing a literary society at Greeneville Coll. He represented Greene and Washington counties in the legislature in 1835, was re-elected in 1839, and the following year made a state reputation by his force of oratory in advocating the election of Martin Van Buren. In 1841 he was elected to the state senate from Greene and Hawkins counties, widened his influence by efficient service and the advocacy of progressive legislation, and in 1843 was elected to Congress as a Democrat.

In Congress he supported the annexation of Texas and the resolution to restore to Gen. Jackson the fine imposed upon him at New Orleans. He was elected Governor of Tennessee in 1853 and was re-elected two years later. In 1857 he became a member of the U.S. Senate. The Kansas-Nebraska bill received his support, but he opposed the Union Pacific Railroad grant, favored the homestead law, and opposed all schemes directed to disorganize the Union. He held his seat in the Senate until President Lincoln appointed him military governor of Tennessee, in 1862, in which capacity he rendered valuable service to the Federal cause. In 1864 he was elected Vice President on the ticket with President Lincoln. On Apr. 15, 1865, Johnson succeeded Lincoln as President, the latter having been assassinated the day before.

The administration of President Johnson is memorable in history on account of the prolonged contest between him and Congress on the reconstruction policy and the readmission of the seceded states. The first breach was the veto, in 1866, of the Freedmen's Bureau bill, which was designed to protect the Negroes, and this was followed by the veto of the civil service bill, a bill for the congressional plan of reconstruction, and the tenure-of-office bill in 1867. In 1866 he suspended and then removed Secretary Stanton, and was forthwith impeached by the House of Representatives. The trial by the Senate took place from March to May 1868, and resulted in his acquittal, his opponents having one less than the necessary two-thirds vote. In 1869 President Johnson temporarily retired to private life, but was again elected U.S. Senator in 1875, and held his seat at the extra session of that year. His death occurred while visiting his daughter near Elizabethton, Tenn., and he was interred at Greeneville.

Johnson, EASTMAN, artist, born in Lovell, Me., July 29, 1824; died Apr. 5, 1906. He became devoted to art in 1841 and studied 10 years in Düsseldorf, Germany. His best paintings include "Corn Husking Bee," "The Old Kentucky Home," "The Boyhood of Abraham Lincoln," and "The School of Philosophy at Nantucket."

Johnson, EDWARD, tenor, born in Guelph, Canada, Aug. 22, 1881(?); died there, April 20, 1959. A naturalized citizen (1922) of the U.S., he sang with the Chicago Opera Co. (1919-22) and with the New York Metropolitan Opera Assn. (1922-35) before serving as general manager of the New York company (1935-50). He inaugurated the Metropolitan Auditions of the Air to promote American artists.

Johnson, HALL, choral director, composer, and arranger, born in Athens, Ga., Mar. 12, 1888. He studied at Atlanta Univ. for a year before entering Allen Univ., South Carolina, of which he father was president. After graduating in 1908, he went to Philadelphia to study and was graduated in music from the Univ. of Pennsylvania in 1910. Going to New York in 1914, he played in dance bands, with which he later toured the country. He formed his Hall Johnson Choir in 1925, but it was three years before the choir performed in concerts. The group was successful, and during the next eight years appeared with the New York Philharmonic, and other important concert, radio, and theater ensembles. Johnson did the arrangements and music direction for "Green Pastures" in New York (1930), and was called to Hollywood to work on the film version in 1936. He stayed there, doing music for "Lost Horizon" (1937), "Way Down South" (1939), "Swanee River" (1940), and "Cabin in the Sky" (1943). Johnson is a frequent contributor of articles to various magazines on Negro music; he also wrote the book and music for the operetta "Run Little Chillun" (1933).

Johnson, HERSCHEL VESPASIAN, jurist, born in Burke County, Georgia, Sept. 12, 1812; died Aug. 16, 1880. He was elected governor of Georgia in 1853, serving four years, and in 1860 was nominated as a candidate for Vice President with Stephen A. Douglas. Though an opponent of the policy of secession, he cast his fortunes with the Confederacy, and was a member of the Senate of the Confederate States. In 1866 he was elected to the U.S. Senate, but was not permitted to serve because of his connection with the rebellion. In 1873, after the removal of disabilities, he was made judge of the superior court of his state.

Johnson, HEWLETT, Dean of Canterbury, born in Manchester, England, Jan. 25, 1874. He first studied engineering, but was ordained a clergyman in the Church of England in 1905. He served at St. Margaret's, Altrincham, until his appointment (1924) as Dean of Manchester, and in 1931 became Dean of Canterbury. He founded the theological monthly *Interpreter* in 1905, and served as its editor for 21 years. Author of many other pamphlets and books, he also wrote "The Socialist Sixth of the World" (which has been translated into 18 languages).

Johnson, HIRAM WARREN, U.S. senator, born in Sacramento, Cal., in 1866; died in 1945. He studied at the Univ. of California and was admitted to the bar. He was elected governor for the term 1911-15, became a Progressive Republican and was nominated for Vice President on the ticket with Theodore Roosevelt, in 1912. He was again elected governor in 1914, receiving a large plurality. In 1916 he was elected U.S. Senator, resigned as governor, and held his seat until his death in 1945. During his tenure in the Senate, he was a stubborn isolationist, also the initiator of an act placing a Federal ban on loans to governments which had not paid their war debts (known as the Johnson Act).

Johnson, HUGH S., soldier and lawyer, born at Ft. Scott, Kan., Aug. 5, 1882; died in 1942. He was graduated from Oklahoma Northwestern Normal School in 1901. Later he was graduated from the U.S. Military Acad. and served as an officer in the regular army from 1903 to 1919, rising to the rank of brigadier general. He served in the Philippine Islands, was overseer of Yosemite and Sequoia National Parks, was transferred to the judge-advocate general's department, and in that capacity served with Pershing's expeditionary force that gave futile chase to Villa through Mexico. In 1916 he was a captain on Gen. Crowder's staff, and it was in that job that he gained high fame. When the U.S. entered World War I he was given the task of framing a draft law. Overnight he prepared the plan for what was to become the selective service act of 1917. In 1933 he was selected by President F.D. Roosevelt as head of the National Recovery Administration, from which he resigned in 1934, becoming Works Progress Administrator for New York City, 1935. He was active as lecturer, radio publicist, and editorial commentator for Scripps-Howard newspapers from 1934 until his death.

Johnson, JAMES WELDON, Negro author, born at Jacksonville, Fla., in 1871; died in 1938. After graduating from Atlanta Univ. (1894), he studied law, was admitted to the Florida bar, and practiced in Jacksonville until 1901. He served as U.S. consul to Venezuela (1906) and to Nicaragua (1909-12). He joined the faculty of Fisk Univ. in 1930 as professor of creative literature. Secretary of the National Assn. for the Advancement of Colored People (1916-30), he wrote many books on the problem of the Negro in America and won the Spingarn Medal (1925).

Johnson, SIR JOHN, American Loyalist, born near Johnston, N.Y., Nov. 5, 1742; died in Montreal, Que., Jan. 4, 1830; son of Sir William Johnson (*q.v.*). He received some education and in 1760 was already a captain in the New York militia. Johnson fled to Canada, with other Loyalists, in 1776, and there organized a force known as the Royal Greens. In 1777 he took part in the battles of Ft. Stanwix and Oriskany. With his brother-in-law, Guy Johnson (1740-88), he helped to organize the Indian raids carried out (1778) by Joseph Brant (*q.v.*) and others on the settlers of the New York frontier. He himself led raids into the Mohawk Valley in 1778 and in the Lower Mohawk and Schoharie valleys in 1780. He later returned to Canada, where he became superintendent of Indian affairs in 1782. He was granted land in Canada by the British. Johnson, a baronet after the death of his father (1774), remained influential in Indian affairs and in support of the displaced Loyalists for many years.

Johnson, LOUIS ARTHUR, lawyer and politician, born in Roanoke, Va., Jan. 10, 1891. After he was graduated (1912) from the Univ. of Virginia, he practiced law. He was a member of the West Virginia legislature in 1917 and served as a captain of infantry during World War I. He resumed his law practice after the war and helped organize the American Legion, of which he was national commander (1932-33). He entered the War Dept. in a civilian capacity in 1933, serving until 1940. President Franklin D. Roosevelt sent him to India in 1942, to study the problems inherent in India's demands for independence. In the same year he became president of the General Dyestuffs Corp., on appointment of the Alien Property Custodian. Pursuing his political career, he aided President Harry S. Truman in his 1948 campaign and was appointed Secretary of Defense in 1949. His term was cut short by the early reverses in the Korean war, which were blamed on his economies in military expenditures.

Johnson, LYNDON BAINES, 36th President of the U.S., born near Stonewall, Texas, Aug. 27, 1908. He was educated at Southwest State Teachers Coll. and Georgetown Law School and later taught school in Texas. After serving as secretary to Rep. Richard M. Kleberg (1932-35), he became a U.S. Representative in 1937 and a Senator in 1949. As Senate Democratic minority (1953) and majority (1955) leader, he gained national reputation for political tact and was credited with unifying the various factions of his party. Elected Vice President of the U.S. in 1960, he became President upon the assassination of John F. Kennedy (*q.v.*), Nov. 22, 1963.

Johnson, MARTIN ELMER, photographer, explorer, born in Rockford, Ill., Oct. 9, 1884; died in Los Angeles, Calif., Jan. 13, 1937. At the age of 14, he ran away to Europe on a cattle boat and began his explorations in 1910. He circled the world six times with his wife, Osa, whom he married in 1910. His most adventurous tour was with Jack London on the *Snark*, a 45-ft. yacht (1917). He filmed African wild life for the American Museum of Natural History (1924-29) and returned to Central Africa to hunt (1929-31). His books include "Through the South Seas with Jack London" (1912) and "Safari" (1927).

His wife, OSA HELEN LEIGHTY JOHNSON (1894-1953) accompanied him on most of his expeditions, continuing his work when he died. In 1941 she married Clark H. Getts. Her books include "Lion" (1929) and "I Married Adventure" (1940).

Johnson, MORDECAI WYATT, university president and clergyman, born in Paris, Tenn., Jan. 12, 1890. After receiving his degree from Morehouse Coll., Georgia, he remained there to teach English, economics, and history. He entered the Rochester Theological Seminary in 1913 and was ordained a Baptist minister in 1916. In 1926 he became the first Negro president of Howard Univ., the largest Negro university in the U.S.

Johnson, RICHARD MENTOR, Vice President of the U.S., born in Bryant Station, Ky., Oct. 17, 1780; died in Frankfort, Ky., Nov. 19, 1850. He studied at Transylvania Coll., was admitted to the bar in Kentucky, and served in the legislature from 1804 to 1807. In 1807-19 he was a Republican-Democratic member of Congress; he served as U.S. Senator from 1819 to 1829, when he was again elected Representative, serving until 1837. The Senate chose him Vice President of the U.S. in 1837, when no Vice President gained an electoral majority; he was the only one who ever attained Vice Presidential office in this way.

Johnson, ROSSITER, editor and author, born in Rochester, N.Y., Jan. 27, 1840; died in New York City, Oct. 3, 1931. After he was graduated from the Univ. of Rochester in 1863, he became a newspaperman. He then became an editor and author and was a staff member of the "American Cyclopedia" (1873-77), of the "Cyclopedia of American Biography" (1886-89), and of other reference works. Among his several publications, "A History of the War of Secession" (1888) and "The Story of the Constitution of the United States" (1906) should be mentioned.

Johnson, SAMUEL, English poet, critic, and scholar, born in Lichfield, England, Sept. 18, 1709; died in London, Dec. 13, 1784. One of the greatest figures in English literature, Johnson is so well known because he was the subject of the greatest biography written in English—Boswell's "Life of Johnson." Indeed, Boswell's "Life" is so widely known and so excellent a book, and Boswell himself so interesting a person, that Johnson's own stature is sometimes obscured..

The son of a Lichfield bookseller, Johnson very early developed the taste for literature that was to make him one of the most learned and most famous men in England. His fame did not come early, however, and for the greater part of his life he was far from affluent. After a brief period at Oxford and a brief period as a schoolmaster, Johnson established himself in London as a professional writer, working as translator, journalist, playwright, poet, novelist, dictionary-maker, critic, editor, and biographer.

Early in his career in London, to which he came in 1737, Johnson became a regular contributor to Edward Cave's *The Gentleman's Magazine*, for which he wrote regularly until 1743. In 1743 he began his work as a professional scholar, working with Oldys in editing *The Harleian Miscellany*. He also began work on an edition of Shakespeare and in 1747 began the monumental "Dictionary of the English Language" to which he devoted eight years, which on its publication in 1755 was to establish his fame, and which alone would have given him literary immortality.

During the eight years of his work on the "Dictionary" Johnson did other work as well. He wrote his best poem, "The Vanity of Human Wishes," in 1749. He wrote *The Rambler*, a periodical journal of essays published every Tuesday and Saturday for two years, from March 1750 until March 1752. He contributed generously to other periodicals. These various tasks, by his own account, he undertook from necessity, during a period of poverty.

After the completion of the "Dictionary," Johnson was less productive. His health had never been good, he was nearly blind, and he was tired. Nevertheless, he published a novel, "Rasselas: The Prince of Abyssinia," in 1759. This philosophical narrative, we are told, was written in a single week to pay the costs of his mother's funeral. In 1765, Johnson completed his long-awaited edition of Shakespeare, and in 1781 he published his "Lives of the Poets," a collection of short biographies of 52 English poets. These biographies, with his "Dictionary," are Johnson's greatest work. In them he clearly establishes himself as one of the greatest of English critics. In spite of some violent prejudices, Johnson's criticism is especially notable for his independent judgment and his good sense. Common sense, indeed, is his outstanding quality as he is revealed in his writings and in his conversation, recorded so fully by Boswell.

Johnson's reputation with posterity rests upon Boswell's "Life," but Boswell's "Life of Johnson" is a great book primarily because Johnson was a great man and because Boswell found a formula to record his greatness. Of relatively humble origin, poor, uncouth in appearance and manners, opinionated, often violent in his conversation, plagued by ill-health from birth, and almost blind, Johnson earned the reputation of being the first writer of his age. He enjoyed a pension from the government and he received an honorary degree from Oxford, the university from which as a young man he had withdrawn. He had become the dominant figure in the literary world and the lion of literary society. His burial in Westminster Abbey was an honor fully earned.

Courtesy National Gallery of Art, Wash., D. C.

SAMUEL JOHNSON

Mezzotint by William Doughty (died 1782)

Johnson, THOMAS, born at St. Leonards, Md., in 1732; died in 1819. He studied law at Annapolis, and served as a member of the first Continental Congress, where he moved the appointment of George Washington as commander-in-chief. In 1776 he was made brigadier general to cooperate with Washington. The following year he was elected governor of Maryland, and throughout the war took a prominent part in the public affairs of that state. He supported the Federal Constitution in the Maryland convention which ratified it in 1789. Two years later he was made an associate justice of the U.S. Supreme Court, and subsequently served as a member of the commission which laid out the city of Washington, D.C.

Johnson, THOMAS LOFTIN, politician, born in Georgetown, Ky., July 18, 1854; died Apr. 10, 1911. He removed to Indiana at an early age, and subsequently was clerk in a street railway office at Louisville, Ky. He invented several railway devices that brought large financial returns,

which enabled him to purchase extensive interests in the street railways of Indianapolis, Detroit, and Cleveland. In 1891 he was elected to Congress as a Democrat, serving four years, and on the floor of the House became prominent as an advocate of the single-tax theories of Henry George. He was elected mayor of Cleveland, Ohio, in 1901, and was re-elected to that position a number of times. He was prominent as an advocate of the three-cent street railway fare movement in Cleveland, which rate was adopted in that city in 1908, but it was not applied successfully in all parts of the municipality.

Johnson, SIR WILLIAM, colonist and general, born in Warrentown, Ireland, in 1715; died in Johnstown, N.Y., July 11, 1774. It was designed that he should pursue a mercantile career, but in 1738 he engaged with his uncle, Sir Peter Warren, to manage a large tract of land on the Mohawk River in New York. He commenced to colonize the land and to promote trade with the Iroquois Indians, in both of which he was successful. By direct intercourse with the Mohawk tribe he learned their language, and was made a sachem by election. His ability as an administrator was recognized by Gov. George Clinton, who appointed him Indian commissioner for New York. At the time of the French and Indian War he was given a baronetcy and a cash fund of $15,000 in recognition of his success against Gen. Dieskau in the Battle of Lake George on Sept. 5, 1755. Later he was made superintendent of the Six Nations with a salary of $3,000, in which position he rendered such valuable service to the British cause that the king granted him a royal patent for 100,000 acres of land north of the Mohawk River. On this tract of land he established Johnstown, in Tyrone County. Later he secured a treaty with the Iroquois Indians, by which the frontier was extended westward to include Kentucky with Virginia as a British possession.

Johnson Act, an act passed by the U.S. Congress in 1934. It prohibits individuals and businesses under the jurisdiction of the U.S. from financial transactions with any foreign government which is in default of its obligations to the U.S. Violators of the act are subject to imprisonment for not more than five years, a fine of not more than $10,000, or both. Since 1940 numerous unsuccessful attempts have been made to repeal or amend the act in order to facilitate international trade.

Johnson City, a city in Washington County, Tennessee, situated east of Knoxville on the Southern, the Eastern Tennessee & Western North Carolina, and the Carolina, Clinchfield & Ohio R.R.'s. Located in a salubrious, mountainous region, Johnson City is a popular health resort. Its principal industries include wood products, such as flooring, furniture and boxes, leather manufactures, iron products, textiles, brick, flour, dairy products, and silk yarn. Population, 1950, 27,864.

Johnston (*jŏn'stŭn*), ALBERT SIDNEY, Confederate general, born in Kentucky, Feb. 3, 1803; slain Apr. 6, 1862. He was graduated from West Point in 1826, and served with distinction in the Black Hawk War. He entered the army of the

Courtesy Brown Bros., N. Y.

ALBERT S. JOHNSTON

Republic of Texas, of which country he subsequently became secretary of war. He served during the Mexican War as inspector general on the staff of Gen. W.O. Butler, and, when peace was secured, became a planter. He later entered the U.S. Army and rose to be paymaster and colonel. When the Civil War commenced he espoused the Confederate cause, and became brigadier general in command of the western forces. Soon after, he fortified the strategic points of Bowling Green, and made an attack with 50,000 men on Gen. Grant at Shiloh, Apr. 6, 1862. The attack was one of the fiercest in the Civil War, and Gen. Johnston was killed on the afternoon of the first day, while leading a charge. He ranked as an able general, not only among the Confederates, but among the military men of America. The common impression that he was a brother of J. E. Johnston is erroneous.

Johnston, ANNIE FELLOWS, juvenile writer, born in Evansville, Ind., in 1863; died in 1931. Most famous of her books for young people are the volumes of the "Little Colonel" series.

Johnston, ERIC ALLEN, industrialist, born in Washington, D.C., Dec. 21, 1895. After working his way through the Univ. of Washington as a longshoreman, he joined the Marines in 1917, later becoming a captain. In his career he has been a salesman, a manufacturer, and an active citizen of Spokane, Wash. In 1942, he was made presi-

dent of the U.S. Chamber of Commerce, a position he held until 1946. In 1944 he visited Soviet Russia to familiarize himself with its administration and commercial possibilities. His book, "America Unlimited," appeared in that same year. Johnston in 1945 became president of the Motion Picture Assn. of America, Inc., and for a number of years has also served as an executive of several corporations. During World War II and throughout the defense mobilization period of the early 1950's, Johnston accepted a variety of government assignments, such as the directorship of the Economic Stabilization Agency (1951) and the chairmanship of the International Development Board (1952). Under the Eisenhower administration he received special assignments concerning possible Arab-Israeli cooperation over the natural resources of the Jordan Valley.

Johnston, JOSEPH EGGLESTON, Confederate general, born in Prince Edward County, Va., Feb. 3, 1807; died in Washington, D.C., March 21, 1891. Graduated from West Point in 1829, he served in the Seminole and Mexican wars as a topographical engineer. Johnston was a brigadier general when he resigned from the U.S. Army on April 22, 1861, to fight for the Confederacy. Appointed to the same rank in the Confederate army, he was assigned to Harpers Ferry, from which he retreated to avoid the superior forces of the Union army. Joining Beauregard at Bull Run, he was largely responsible for the Confederate victory there (July 1861), for which he was made a Confederate general. As commander of the Army of Northern Virginia, he was George McClellan's antagonist in the Peninsula Campaign until he was wounded at the Battle of Fair Oaks in May 1862. Later that year he was appointed commander of Confederate forces in the West. Believing his command to be only nominal, Johnston failed to act on President Davis' orders which gave him authority over J. C. Pemberton's forces in Mississippi and Braxton Bragg's army in Tennessee. When at last he did intercede, it was too late to prevent Pemberton's surrender at Vicksburg on July 4, 1863. Johnston fell into further disfavor with Davis by pursuing a policy of strategic retreat against William T. Sherman (*q.v.*) in the Atlanta Campaign. Removed from his command (July 1864), he was later reassigned, only to surrender to Sherman at Durham Station, N.C., on April 26, 1865. After the Civil War, he entered the insurance business and was (1879-81) a member of the House of Representatives from Richmond, Va. President Grover Cleveland appointed him commissioner of railroads in 1885. He wrote "Narrative of Military Operations" (1874).

Johnston, MARY, novelist, born in Buchanan, Va., Nov. 21, 1870; died in Warm Springs, Va., May 9, 1936. In 1898 she published "Prisoners of Hope," the first of a series of literary romances dealing with the life of colonial Virginia. "To Have And to Hold" (1900) and "Audrey" (1902) gained immense popularity. Two of her novels, "The Long Roll" (1911) and "Cease Firing" (1912), are historically vivid stories of the Civil War. She continued to write throughout her life, "Miss Delicia Allen" being the last of her books to be published (1932).

Johnstown (*jŏnz'toun*), county seat of Fulton County, New York, 40 m. N.W. of Albany. It is on Cayadutta Creek. Among the manufactures are gloves, shoe leather, machinery, glue, gelatine, clothing, and knit goods. The region was settled in 1762 by Sir William Johnson, after whom the city was named. Its city charter was issued in 1895. Population, 1950, 10,923.

Johnstown, a city in Cambria County, Pennsylvania, at the confluence of Stony Creek and the Conemaugh River, 60 m. E. of Pittsburgh, on the Pennsylvania and Baltimore & Ohio R.R.'s. Surrounded by a country rich in coal and fire clay, the city manufactures steel, brick, cement, furniture, pottery, clothing, plastics, and hardware. Johnstown was settled *ca.* 1790; it was incorporated as a village in 1800, as a borough in 1831, and as a city in 1889. The city was almost totally destroyed on May 31, 1889, when a dam in the Conemaugh River burst and drowned more than 2,200 persons. The city soon recovered and developed rapidly in trade and commerce. In the spring of 1936, Johnstown suffered a second flood, after which a flood control project was constructed by U.S. Army Engineers. Population, 1950, 63,232.

Johore (*jō-hōr'*), one of the nine states in the Federation of Malaya (established 1948), located at the southern end of the Malay Peninsula in Southeast Asia; area, 7,321 sq. m. It is largely covered by dense jungles and is traversed by the Muar, Endau, and Johore rivers. Rubber, coconuts, and pineapples are important commercial crops, rubber being the chief export. Other agricultural products are rice, copra, and gambier. There are also tin and iron mines. Johore Bahru, the capital, is just northeast of Singapore, with which the state is connected by a causeway across Johore Strait. Johore was founded as a Mohammedan state by a former sultan of Malacca sometime after 1511. It came under British influence in 1819, when it ceded Singapore to Great Britain. Johore established treaty relations with Britain in 1885 and 1914; from 1914 to 1948 it was part of the Unfederated Malay States. It was occupied by the Japanese, 1942-45. The inhabitants are mainly Malays and Chinese. Population, 1947, 738,251.

Joint (*joint*), in anatomy, a connection between the bones and cartilaginous formations of the skeleton. The joints permit the movements of the animal frame, contribute to the strength of

the skeleton, especially of the back and the lower limbs, and give form and shape to the body. They are either *movable* or *immovable*. The former include such as the joints of the hip, shoulder, and ankle, and the latter include the frontal and parietal bones. The end of one bone in a joint is usually convex, that of its companion bone is concave, and both ends are covered by a thin layer of elastic cartilage. This cartilage has a highly polished surface and serves to facilitate motion and to deaden shock. The movable joints are usually divided into planiform, hinge, and ball and socket joints.

In the *planiform joints* the surfaces are more or less plane, permitting a gliding movement, as in the tarsal and metatarsal articulations of the foot. They permit only a limited motion, but impart elasticity and slight flexibility. The *hinge joints*, which permit motion in two directions, are provided with very strong ligaments on the sides, as in the elbow, ankle, and finger. In the joints of the ankle and the fingers the tendons of certain muscles replace the ligament. In the *ball and socket joint* there is a cuplike cavity in one of the bones, into which a headlike extremity of the other bone is fitted, the latter being held in place by a membranous capsule. This class of joints permits great freedom of motion in all directions, as in the joints of the hip and the shoulder. The socket in the latter is not so deep as that of the hip and so permits greater freedom of motion, but the joint is more easily dislocated. A secretion called *synovia* is supplied by a thin membrane that surrounds the joints, serving to moisten and lubricate them.

Joint-Firs (*joint' fûrz*), the common name of several species of small trees and shrubs closely related to the coniferous plants. A number of these are native to the southwestern part of North America, and others are found in the warmer parts of Asia and Europe. They are so named from their jointed stems. The juices are not resinous but are watery or somewhat gummy.

Joints (*joints*), in geology, fissures of a peculiar kind that divide rock masses. They usually occur in parallel lines of a system of clefts. Joints are due either to the passage of earthquake waves or faults resulting from strains by the forces that elevate the surface. They differ from dividing surfaces of strata in that the texture is the same on both sides of the dividing line, and from cleavage (*q.v.*) by the fact that the blocks are thicker and have little or no tendency to split in the same direction. Joints are designated as *strike*, *dip*, and *diagonal joints*, depending upon whether they run parallel to the strike or to the dip, or extend diagonally across either of these.

Joint Stock Company (*joint stŏk kŭm'pa-nĭ*), the name usually employed to designate a partnership in which the capital is distributed among a number of partners. They assume in certain respects a corporate form, but possess legally none of the peculiar attributes or powers of corporations. Joint stock companies are either limited or unlimited, and they may become incorporated under the law by complying with its requirements. A *limited* company has one of two forms, in one each member is liable up to the amount unpaid on the shares that he stipulated to purchase, and in the other the liability of each member is limited to the amount he agrees to contribute to the assets should the business of the company be discontinued. In an *unlimited* company the liability of the members has no legal limit. The word *limited* must be added to the name of the company, in case the liability is to be restricted, which serves to give notice to the public of the character of the organization. In addition the company must keep a record to show the place of business, the amount of capital, the limit or the amount of guarantee, and the object for which the association of individuals is established.

Joinville (*zhwăn-vēl'*), FRANÇOIS FERDINAND D'ORLÉANS, PRINCE DE, soldier, third son of King Louis Philippe, born in Neuilly, France, Oct. 14, 1818; died June 16, 1900. After studying in the Coll. of Henry IV, he took a course of instruction in the naval school of Brest. He became a lieutenant in the French navy in 1836, four years later commanded the frigate which brought the remains of Napoleon from St. Helena to France, and in 1843 married the daughter of Dom Pedro I, Emperor of Brazil. In 1844 he commanded the French fleet against Morocco, and was made vice admiral for distinguished services. He removed to America in 1861 and, together with his two nephews, served in the Civil War under McClellan. He lived in retirement in France after 1871, though he served for a brief period in the French national assembly, and later published several books relating to military subjects.

Jokai (*yō'kō-ē*), MAURUS, novelist, born at Komorn, Hungary, Feb. 19, 1825; died May 5, 1904. He studied in Budapest and began the practice of law, but soon engaged in literary work. He took a part in the uprising against Austria in 1848, and later was elected to the Hungarian chamber. In 1863, he began the publication of *Fatherland*, in which he published many of his novels. "Working Days," his first novel, was widely read. Other publications include "Black Diamonds," "A Hungarian Nabob," "The Romance of the Next Century," and "History of Hungary."

Joliet (*jō'li-ĕt*), county seat of Will County, Illinois, on the Des Plaines River, 40 m. s.w. of Chicago. It is on the Atchison, Topeka & Santa Fe, the Michigan Central, the Gulf, Mobile &

Ohio, the Chicago, Rock Island & Pacific, and the Elgin, Joliet, & Eastern R.R.'s, and on the Illinois & Michigan Canal. The surrounding country is a fertile agricultural and dairying district, which also produces an excellent quality of Silurian limestone and bituminous coal. Noteworthy buildings are the state penitentiary, St. Francis Acad., and the Coll. of St. Francis. Joliet manufactures steel wire, flour, lime, shoes, matches, pottery, and farming utensils. There are also railroad shops and foundries. The place was settled in 1831 and incorporated in 1852. Population, 1900, 29,353; in 1940, 42,405; in 1950, 51,601.

Joliet (*zhō lyā'*) or JOLIET, LOUIS, explorer, born in Quebec, Canada, Sept. 21, 1645; died in May 1700. He was educated at the Jesuits' Coll. of Quebec but decided to become an explorer and trader rather than a priest. He spent a number of years as a trader among the Indians and learned their language. In the meantime he learned much of the geography of what was then considered the West. In 1672 he was selected by Governor Frontenac to explore the Mississippi River. He was joined in this enterprise by Jacques Marquette (*q.v.*) and five others and by Dec. 8, 1672, had proceeded as far as Mackinac. Through information secured from the Indians, they outlined a map of their proposed route. They ascended the Fox River from Green Bay, then descended the Wisconsin River and entered the Mississippi on June 17, 1673. After floating down the river below the mouths of the Missouri and the Ohio and visiting several Indian villages, they became assured that the river flows into the Gulf of Mexico, and so returned. In September they reach De Pére, where they wintered at the mission of St. Francis Xavier. Joliet returned to Quebec in 1674. The maps and papers prepared by Joliet were lost when his canoe upset in the St. Lawrence River. However, the notes prepared by Marquette furnished ample data. In 1680 Joliet secured a grant of Anticosti Island from the French for his achievements as an explorer. In 1691 the British destroyed a fort built by him on the island. Subsequently he explored the Gulf of St. Lawrence and the Hudson Bay area.

Joliette (*zhō lyĕt'*), capital of Joliette County, Quebec, 42 m. n. of Montreal. It is connected with the St. Lawrence River by a railway of 12 m. and is on the Canadian Pacific R.R. The manufactures include leather, lumber products, and machinery. Joliette has a hospital and a college. Limestone quarries are worked near L'Assomption River, on which the city is located. Population, 1951, 16,064.

Joliot-Curie (*zhō lyō'kü rē'*), IRÈNE and FREDERIC, physicists. Irène Curie, born Sept. 12, 1897, in Paris; died there, March 17, 1946, was the elder daughter of Pierre and Marie

JOLIET AND MARQUETTE, DISCOVERERS OF THE MISSISSIPPI

Courtesy Bettmann Archive, N. Y.

IRÈNE AND FRÉDÉRIC JOLIOT-CURIE

Curie, the discoverers of radium. She grew up in the laboratory, and, after receiving her M.A. from the Sorbonne, she became her mother's assistant in the Radium Inst. of the Univ. of Paris in 1918. There she met (JEAN) FRÉDÉRIC JOLIOT (born in Paris, March 19, 1900; died there, Aug. 14, 1958). They were married in 1926 and worked together in the laboratory, using the name Joliot-Curie. They were awarded the 1935 Nobel Prize in chemistry for their discovery that radioactivity can be produced artificially, a development of prime importance in later research on the atom. Their work was temporarily interrupted in World War II, and Joliot-Curie was an underground-resistance leader during the German occupation. He was a Communist party member and in 1950 lost the directorship of the French Atomic Energy Commission, which he had headed for four years. A recipient of the 1951 Stalin Peace Prize, he was elected a member of the French Communist party's Central Committee in 1956. In the same year he became professor of science at the Univ. of Paris and director of the Curie Laboratory of the Radium Inst.

AL JOLSON
In "The Jazz Singer"

Courtesy Warner Bros. Pictures, Inc.

Jolson (*jōl'sŭn*), AL, actor, singer, born ASA YOELSON in St. Petersburg (now Leningrad), Russia, May 26, 1886; died in San Francisco, Calif., Oct. 23, 1950. He appeared on the stage at the age of 13 and later acted in vaudeville and minstrel shows. In 1911 he starred in *"La Belle Paree,"* the first of many extravaganzas that made him a stage favorite. Among the others that followed were "Robinson Crusoe, Jr." (1916), "Sinbad" (1918-20), "Bombo" (1921), "Big Boy" (1925), "Wonder Bar" (1931), and "Hold Onto Your Hats" (1940). He made a number of films, his best-known being "The Jazz Singer" (1927), the first "talkie." Other films include "The Singing Fool" (1928, in which he sang his famous song "Sonny Boy"), "Say It With Songs" (1929), "Wonder Bar" (1934), "The Singing Kid" (1936), "Rose of Washington Square" (1939). His career was portrayed in two film biographies, "The Jolson Story" (1946) and "Jolson Sings Again" (1949), in which his voice was used in the soundtrack.

Jomini (*zhō-mē-nē'*), BARON ANTOINE HENRI, historian and soldier, born in Payerne, Switzerland, March 6, 1779; died in Passy, France, March 24, 1869. He showed early preference for military activities and military-historic writing and published a famous treatise, *"Traité des grands opérations militaire,"* in 1804-05. He became a staff officer in the French army and served as aide-de-camp to Marshal Ney. Following a quarrel with Marshal Berthier, Napoleon's chief of staff, he entered (1813) the Russian army, where a commission had been waiting for him since 1808. By 1823 he had risen to general and was a famous authority on strategy. He retired in 1829 and settled in Brussels. In 1859 he moved to Passy. Two other of his military works are "Report on the Art of War" (1836) and "A Critical and Military History of the Campaigns of the Revolution" (15 vols., 1819-24).

Jommelli (*yōm-mĕl'lē*) or JOMELLI, NICCOLÒ, composer, born in Aversa, Italy, Sept. 10, 1714; died in Naples, Aug. 25, 1774. His first opera, *"L'errore amoroso"* (1737), was an instant success, and he continued to compose dramatic works. He was assistant choirmaster (1749-54) at St. Peter's in Rome, where he wrote church music, and Kapellmeister, or musical director (1754-69), to the duke of Württemberg in Germany. After his return to Italy, he continued to write operas and sacred music. His last work, a Miserere (1773), is considered his masterpiece, among a total of about 70 compositions.

Jonah (*jō'nạ*), or JONA, or JONAS, a Hebrew prophet from Gath-hepher, in Galilee, and son of Amittai (II Kings, 14:25). He lived during

Courtesy British Information Services, N. Y.

DESIGN BY INIGO JONES

Banqueting House of Whitehall Palace, now a museum

the reign of Jeroboam II in the 8th century B.C., and his history is recounted in the Old Testament Book of Jonah. The prophet, summoned by God to reform Nineveh and warn the people of their inevitable doom, set sail for Tarshish to avoid his mission. When a storm befell the ship, the sailors became frightened and threw lots to discover the evil person aboard. The lot fell on Jonah, and he agreed to be thrown overboard and was swallowed by a whale. He was spit out on shore after three days and, when summoned again, he went to Nineveh. He preached so successfully that God showed mercy to the repentant Ninevites and did not destroy the city. Theologians have compared the story of Jonah with the plight of the Israelites, who, disobeying the word of God, were scattered in foreign lands. The story is also regarded as an indication of the Resurrection of Christ.

Jónasson (*yō'näs-sōn*), JÓHANNES, also known as UR KÖTLUM, Icelandic poet, born in Dalir, Iceland, in 1899. Formerly a teacher, he later began to devote all his time to writing. Among his works are a trilogy: "Dead Man's Island" (1949), "The Great Voyage" (1950), and "The Continent of Liberty" (1952); and "Seven Days Mountain" (1955).

Jonathan (*jŏn'ạ-thạn*), eldest son of King Saul. With his father he battled against the Philistines and was finally killed by them in the battle on Mt. Gilboa. A devoted friend of David (*q.v.*), he remained faithful to him through all the jealousy and hatred with which his father sought David's destruction, and the love of David and Jonathan is proverbial. The story of Jonathan is recounted in the first Book of Samuel in the Old Testament.

Jonathan, a descendant of Gershom, a priest of the Levite tribe. The Danites induced him to leave the house of Micah, steal his graven image, and become their priest (Judges 17:7-13; 18:3-30).

Jonathan Maccabaeus (*măk-ạ-bē'ŭs*), youngest son of Mattathias and head of the Maccabaean house after the death (160 B.C.) of his brother Judas (see *Maccabees*). An able soldier and politician, he was slain in Gilead in 143 B.C. His life is described in the Books of the Maccabees.

Jones (*jōnz*), ANSON, surgeon, president of the Republic of Texas, born in Great Barrington, Mass., Jan. 20, 1798; died in Houston, Texas, Jan. 9, 1858. After he received (1827) his M.D. degree from Jefferson Coll., he opened a doctor's office in Philadelphia but was unsuccessful and left the city after five years. He moved to Texas in 1833. An ardent supporter of independence for Texas, he served as a physician in Gen. Sam Houston's army. During the brief lifetime of the young Republic of Texas, he was minister to the U.S. (1838), secretary of state (1841), and its last president (1844-46). The annexation of Texas ended his political career.

Jones, CASEY. See *Jones, John Luther.*

Jones, HENRY ARTHUR, playwright, born in Grandborough, England, Sept. 20(?), 1851; died in Hampstead, Jan. 7, 1929. His first success was "The Silver King" (1882, written with Henry Herman). Most of his plays, both comedies and dramas, were concerned with social criticism and include "Saints and Sinners" (1884) "The Middleman" (1889), "The Masqueraders" (1894), "The Liars" (1897), "Mrs. Dane's Defense" (1900), "The Lie" (1914), and "The Pacifists" (1917).

Jones, INIGO, architect, born in London, England, July 15, 1573; died on July 5, 1652. He

traveled widely in Europe, particularly in Italy, where he studied the Renaissance buildings of Andrea Palladio (*q.v.*). James I appointed (1615) him surveyor of royal buildings, and he designed the royal banqueting hall in Whitehall, London. Regarded as his finest work, this building introduced the severe classicism of Palladio and laid the groundwork for the classic-style architecture of 17th-century England and the Georgian periods (see *Georgian Style*). He continued as court architect under Charles I, designing or reconstructing such lovely buildings as the Church of St. Paul, part of Greenwich Hospital (1635), and many private homes in London and the countryside.

Jones, JAMES KIMBROUGH, soldier and politician, born in Marshall County, Mississippi, Sept. 29, 1839; died in Washington, D.C., June 1, 1908. His family moved to Arkansas when he was nine. After serving as a Confederate soldier in the Civil War, he began to practice law in 1874. A member of the Arkansas state senate (1873-79), he served in the U.S. House of Representatives, 1881-85, and in the Senate, 1885-1903. His political career led to his selection as chairman of the Democratic National Committee in 1896, and he managed William Jennings Bryan's Presidential campaigns of 1896 and 1900. Interested in tariff matters and bimetallism, he was a spokesman for free coinage of silver.

Wide World Photo

JENNIFER JONES

Jones, JENNIFER (stage name of PHYLIS ISLEY), motion-picture actress, born in Tulsa, Okla., March 2, 1919. She studied dramatics at Northwestern Univ. and at the American Acad. of Dramatic Arts in New York, N.Y. Her first starring role, in "The Song of Bernadette," won her a Motion Picture Acad. Award in 1943. She later appeared in "Since You Went Away" (1944), "Portrait of Jennie" (1949), "Love Is a Many-Splendored Thing" (1955), "The Man in the Gray Flannel Suit" (1956), "A Farewell to Arms" (1958), and "Tender Is the Night" (1962). She is the wife of David O. Selznick, producer of many of her films.

Jones, JESSE HOLMAN, banker, public administrator, born in Robertson County, Tennessee, April 5, 1874; died in Houston, Texas, June 1, 1956. Entering the lumber business in Texas at the age of 21, Jones later turned to finance. He founded the Texas Trust Co. at Houston, became chairman of the board of the city's National Bank of Commerce, and published the Houston *Chronicle*. He was a millionaire when he became head of the Reconstruction Finance Corp. (*q.v.*) in 1933. He remained in this post until 1939 and then became administrator of the Federal Loan Agency (1939) and Secretary of Commerce (1940), resigning (1945) from these positions at the request of President Franklin D. Roosevelt.

Jones, JOHN LUTHER, known as CASEY JONES, born near Cayce(?), Ky., March 14, 1864; died near Vaughn, Miss., April 30, 1900. He became an engineer on the Illinois Central R.R. in 1890.

Courtesy B. Botkin, Croton-on-Hudson, N. Y.

JOHN LUTHER JONES

Driving the "Cannonball Express" ("the old 638") from Memphis, Tenn., to Canton, Miss., he was unable to avoid ramming a freight train. Ordering his fireman (Sim Webb) to jump to safety, Jones died in the crash. The story of his bravery was told and sung by railroad men, and the ballad "Casey Jones" was later published.

Jones, JOHN PAUL, naval commander, born in Kirkbean Parish, Scotland, July 6, 1747; died in Paris, France, July 18, 1792. His real name was

JOHN PAUL JONES

John Paul, and he added the "Jones" himself. At the age of 12 he began his maritime career apprenticed to a shipowner in Whitehaven, England, and later sailed the West Indies. In 1775 he was given a commission in the Continental navy, and two years later he sailed the American sloop *Ranger* to France, from where he raided the British coast. In 1778 he captured the British sloop *Drake*. With a worn-out, French, 40-gun boat, which he named the *Bonhomme Richard*, he fought (1779) the British frigate *Serapis* in one of the fiercest battles of naval history. Jones, his ship sinking and on fire, is reputed to have answered the British captain's query of surrender with, "Sir, I have not yet begun to fight." He and his crew then boarded the *Serapis* and took her, while the *Bonhomme Richard* was slowly sinking alongside. After serving (1788-89) with the Russian navy, he spent his last years in Paris, where he was buried. Although he is today considered one of America's great naval heroes, he was plagued by political intrigues and resentment of other naval officers; he received, however, a gold medal from the U.S. Congress for his brilliant exploits. His supposed remains were brought to the U.S. in 1905 and are enshrined at Annapolis, Md.

Jones, JOHN PERCIVAL, politician, born in Herefordshire, England, Jan. 27, 1829; died in Santa Monica, Calif., Nov. 27, 1912. He was brought to Ohio as an infant and went to the West during the gold rush. A member (1863-67) of the California state senate, he moved (1868) to Nevada, where he made a fortune from a silver mine, the famous Crown Point mine. Becoming a spokesman for the silver miners and for free coinage of silver, he served in the U.S. Senate from 1873 until he retired in 1903.

Jones, MARY HARRIS, labor leader, known as MOTHER JONES, born in Cork, Ireland, May 1, 1830; died in Silver Spring, Md., Nov. 30, 1930. Always interested in the labor movement, she became prominent in Chicago labor circles after her husband and children died of yellow fever in 1867. An able speaker and organizer, she took part in many major strikes and was an active organizer for the United Mine Workers of America.

Jones, ROBERT EDMOND, stage designer, born in Milton, N.H., Dec. 12, 1887; died there, Nov. 26, 1954. After graduating (1910) from Harvard Univ., he began designing stage settings. His work was seen in "Richard III" (1920), "Macbeth" (1921), "The Green Pastures" (1930), "The Philadelphia Story" (1939), "Lute Song" (1946), and "The Enchanted" (1950). He is particularly associated with Eugene O'Neill, having designed the settings for many of his plays: "Anna Christie" (1922), "Desire Under the Elms" (1924), "Mourning Becomes Electra" (1931), "Ah, Wilderness!" (1933), and "The Iceman Cometh" (1946). He wrote "Continental Stagecraft" (1922), with Kenneth Macgowan (*q.v.*), and "The Dramatic Imagination" (1941).

Jones, ROBERT TYRE (BOBBY), JR., golfer, born in Atlanta, Ga., March 17, 1902. He was graduated (1924) from Harvard Univ., studied law (1926-27) at Emory Univ., and was admitted to the bar in 1928, practicing thereafter in Atlanta. The first amateur in almost 40 years to win the British Open golf championship (1926, 1927, 1930), he won the U.S. National Open four times (1923, 1926, 1929, 1930) and held the U.S. National Amateur crown five times (1924, 1925, 1927, 1928, 1930). In 1930 he made his "grand slam," winning the National Open, the National Amateur, the British Open, and the British Amateur tourneys, after which he retired from tournament play. He wrote "Down the Fairway" in 1927, with O. B. Keeler, and served with the U.S. Army Air Force during World War II.

Jones, RUFUS MATTHEW, clergyman and college professor, born in South China, Maine, Jan. 25, 1863; died in Haverford, Pa., June 16, 1948. Educated at Haverford Coll. and at Heidelberg, Oxford, and Harvard universities, he taught philosophy at Haverford (1893-1934). A widely known American Quaker, he was a founder (and chairman, 1917-27 and 1934-44) of the American Friends Service Committee for European Relief; through this organization many conscientious objectors did relief work in Europe in lieu of military service. The committee was continued after World War I, operating as a relief agency in the Spanish Civil War (1936-39) and in World War II.

Jones wrote a number of books on various aspects of religion and Quaker history, including "Quakerism, a Religion of Life" (1908), "The New Quest" (1928), "Radiant Life" (1944), "The Luminous Trail" (1947), and an autobiography, "A Small-Town Boy" (1941).

Jonquil (*jŏn'kwĭl*), a species of narcissus. The common jonquil has yellow flowers and is a native of Southern Europe.

Jonson (*jŏn'sŭn*), BENJAMIN, popularly called Ben Jonson, poet and dramatist, born in Westminster, England, in 1572 or 1573; died Aug. 6, 1637. He was descended of Scottish parents. A posthumous child, he was educated in the Westminister school at the expense of William Camden, the historian. It is thought that he was apprenticed to his stepfather, a master bricklayer, immediately on leaving school, but he may have attended St. John's Coll., Cambridge. In any case, he spent some time as a soldier in an English regiment in the Low Countries and was married on his return to England, about the year 1592.

It seems likely that he began his literary career at an early age, although he was first known as an actor. In 1598, we hear of him in connection with the lord chamberlain's company which produced his famous comedy, "Every Man in His Humour," at the Curtain Theater in London. One part in the play was acted by Shakespeare. Following a duel in which Jonson killed an actor in Henslowe's company, he was imprisoned, but was released after forfeiting his possessions and being branded on the left thumb. For some reason, he was converted to Catholicism at this time and remained a Catholic for some 12 years. A second and more elaborate comedy, "Every Man Out of His Humour," was produced by the lord chamberlain's company at the Globe Theater, in 1599, and some time later a performance was given before Queen Elizabeth. "Cynthia's Revels," performed by the queen's chapel children, in 1600, at Blackfrairs, contained attacks on his friends, Dekker and Marston, contemporary writers of the period. "The Poetaster" (1601) was another such production.

About this time, Jonson began to write tragedies and masques. The tragedy, "Sejanus," was performed by the king's servants at the Globe Theater in 1603. Shakespeare, with whom Jonson enjoyed a long and pleasant acquaintance, again had a part in this play. During the reigns of James I and Charles I, Jonson was very much in demand to provide court entertainment. He had a number of bountiful patrons and was frequently commissioned by the king and queen or by Lord Althorpe, Lord Albany, Philip Henslowe, the Earl of Salisbury, the Earl of Newcastle, or Viscount Falkland. Among his best masques were: "The Satyr" (1603), "The Penates" (1604), "Masque of Blackness" (1605), "King's Entertainment" (1604), "Hymenaei" (1606), "Masque of Beauty" (1608), "The Hue and Cry After Cupid" (1608), "Masque of Queens" (1609), and "Oberon, the Fairy Prince" (1611). Inigo Jones constructed the sets for many of these masques. A second tragedy, "Catiline," was produced in 1611. Of his comedies, the most famous were: "Volpone, or the Fox" (1605), "Epicoene, or the Silent Woman" (1609), "The Alchemist" (1610), and "Bartholomew Fair" (1614).

BEN JONSON *Courtesy Brown Bros., N. Y.*

Jonson occasionally got into trouble with his plays and alternately quarreled and collaborated with his friends. On the whole his affairs were very badly managed, for he delighted in his library and the company at the Mermaid Tavern, and was more or less constantly in financial difficulties. Given a small pension of about £66 a year in 1616, he published the first volume of the folio collected edition of his works and two years later went off to Scotland for a prolonged holiday (1618-19). In Edinburgh, he was much in the company of the scholarly Scottish poet, William Drummond. Jonson's "Conversations," written at this time, constitute a sort of journal and probably the best source of data on his life. On his return to court, he was given the office of master of the revels, and his pension was increased to £200. Although he became poet-laureate under Charles I, he did not fare so well, for his powers had begun to decline, and he was neither prosperous nor in good health. He wrote a few more comedies and masques and eked out a small salary as city chronologer after 1628. At his death, he left an unfinished pastoral poem of great beauty, "The Sad Shepherd," which was published in 1641. The most famous of his love songs is "To Celia," better known as "Drink to Me Only With Thine Eyes." He was buried in Westminster Abbey, his monument being inscribed with the words, "O rare Ben Jonson."

An exuberant and versatile figure with many eccentricities, Ben Jonson was greatly admired by contemporary writers and recognized as the leader of the English literary world of his time. His plays, although inclined to be somewhat pedantic, since Jonson was a man of considerable erudition, were distinguished for their power and richness, for their great humor and acute observations on the life and times.

Joplin (*jŏp'lĭn*), a city of Jasper and Newton counties, Missouri, *ca.* 75 m. w. of Springfield, on the Missouri, Kansas & Texas, the Missouri Pacific, the St. Louis & San Francisco, and the Kansas City Southern R.R.'s. Nearby are extensive deposits of zinc and lead. Large quantities of fruits are produced in the vicinity. The features include Schifferdecker Park with its Mineral Museum and the home of J. C. Cox, the first settler. Among the manufactures are machinery, ironware, steam boilers, soap, and flour. Smelting works and foundries give employment to many. Joplin has a large trade in produce and merchandise. It was founded in 1839 and incorporated as a city in 1874. Population, 1940, 37,144; in 1950, 38,711.

Jordaens (*yôr'däns*), JACOB, painter, born at Antwerp, Belgium, May 19, 1593; died Oct. 18, 1678. He studied at Antwerp, where he became a friend of Rubens, with whom he worked for many years. In 1665 he was invited by Charles Gustavus of Sweden to paint a series of 12 pictures representing the passion of Christ, now in Stockholm. After the death of Rubens, he was considered the leading Flemish historical and portrait painter of his time. His figures are inclined to corpulency and his coloring is peculiarly harmonious. That he was prolific as a painter is shown by the fact that specimens of his work are in the principal galleries of Europe. Among his chief productions are: "The Entombment of Christ," "Admiral Ruyter," "Christ Driving the Money Lenders from the Temple," "Triumph of the Stadtholder," "Jupiter and Mercury," and "Commerce and Industry Protecting the Arts."

Jordan (*jôr'dən*), the most important river of Palestine, *ca.* 200 m. long; it flows through the Jordan valley, the northern extension of the Great Rift Valley which extends from Syria into southern Africa. The Jordan has several sources, the main rising in the Anti-Lebanon Mts. in Syria. From there it flows south, traverses Lake Huleh (the Waters of Merom), and the Sea of Galilee, and then follows a sharply irregular course until it reaches the Dead Sea. Not navigable, it is generally a narrow and stagnant stream, flowing through hot, desolate country, most of it below sea level. Between Lake Huleh and Galilee, the river marks part of the border between Israel and Syria and, below Galilee, part of the Israel-Jordan border. It is frequently mentioned in the Bible; Christ was baptized in the Jordan (Mark 1:9).

Jordan, HASHEMITE KINGDOM OF. See *Transjordan.*

Jordan (*zhôr'dŏn*), CAMILLE, statesman, born in Lyons, France, Jan. 11, 1771; died May 19, 1821. His active resistance to a republican government caused his proscription by the directory in 1793, and he fled for safety to Switzerland and later to London. He returned to Lyons in 1796, and the following year was elected as a deputy to the Council of Five Hundred, before which he advocated religious liberty. After the Revolution he resided in Germany, where he met Goethe and became imbued with a deep interest for German literature. The consulate party recalled him in 1800, when he opposed Bonaparte and boldly exposed the ambitious schemes of the First Consul. Under Louis XVIII he was appointed counselor of state, and, in 1816, he was elected to the chamber of deputies. In the intervening periods he devoted himself to literature and published several speeches and treatises.

Jordan, DAVID STARR, naturalist and educator, born in Gainesville, N.Y., Jan. 19, 1851; died Sept. 19, 1931. He was educated at Cornell Univ. and the Indiana Medical Coll., taught at Lombard Univ., Illinois, in 1872, and later at various other important educational centers. From 1879 until 1881, he was special agent for the U.S. Census and as such made a valuable report on the marine industries on the Pacific coast. He was connected with the Fish Commission until 1891, when he was elected president of Leland Stanford, Jr., Univ., but resigned the active presidency in 1913 to become chancellor. Dr. Jordan was noted as a lecturer and writer on various subjects, including psychology, world peace, and ichthyology.

Jorullo (*hô-rōōl'yô*), a volcanic mountain about 150 m. w. of the city of Mexico, thrown up by volcanic force on Sept. 29, 1759. It consists of numerous cones, some of which give out vapor. The highest elevation is 4,250 ft. above sea level. Owing to the gradual loss of temperature, foliage and forest trees have slowly moved upward and now cover most of the region.

Joseph (*jō'zĕf*), the husband of Mary, the mother of Christ. He was descended from the house of David and was by trade a carpenter. Both he and Mary went with Jesus when He was 12 years old to the feast of the Passover at Jerusalem. Joseph is not spoken of after Jesus had reached the age of 12. It is thought probable that he died before the crucifixion. Mar. 19 is assigned as his festival.

Joseph, the favorite son of Jacob and the eldest by his wife Rachel, Benjamin being his only brother. He had ten older half-brothers. Jacob's preference for Joseph made the elder brothers en-

vious. When an occasion presented itself, he was sold to some slave dealers, who in turn sold him to Potiphar, an officer of Egypt, the brothers reporting him killed to Jacob. The story of the life of Joseph is given in Genesis and relates his advancement under Pharaoh, his power in interpreting dreams, his ability in business affairs, his abhorrence of sin, his making himself known to his brothers and later to his father, and his diligence in saving them all in the time of famine. Joseph died in Egypt, was embalmed, and his remains were taken to Shechem in the land of Canaan, but neither the time of his death nor of his history is known, some authorities placing it before and some after the Hyksos or Shepherd kings of Egypt. He was 110 years old when he died, leaving two sons, Manasseh and Ephraim. As the two sons of Joseph were adopted by Jacob, they received a place among the heads of the tribes.

Joseph, the name of two sovereigns of the Holy Roman Empire. *Joseph I* was born in Vienna, Austria, July 26, 1678, and was crowned King of Hungary at the age of 11. He succeeded his father, Leopold I, as ruler of the Holy Roman Empire in 1705. The events of his reign include the seizure of Cologne and Bavaria, the conquest of Naples, and the War of the Spanish Succession. He died Apr. 17, 1711. *Joseph II* was born Mar. 13, 1741, and died Feb. 20, 1790. He was a son of Francis I and Maria Theresa and succeeded to the throne of the Holy Roman Empire in 1765, but he did not succeed his mother on the throne of Austria until 1780. He was progressive and liberal and attempted many reforms in his kingdom and the empire. These included the abolition of serfdom, the institution of religious liberty, the abolition of monasteries, the reform of jurisprudence, and the establishment of a system of public schools, but in these measures he was opposed by the nobles and the clergy, who compelled him to yield to the opposition in 1790.

Josephine (*jō'zĕ-fēn*), MARIE ROSE, Empress of France, born in the Isle of Martinique, June 23, 1763; died in Malmaison, France, May 29, 1814. She received only an ordinary education, but her excellent qualities of heart and natural intellectual faculties, coupled with beauty of form and feature, won her universal regard. In her 16th year she married Viscount Beauharnais and was the mother of two children—Eugene, Viceroy of Italy, and Hortense, Queen of Holland. During the reign of terror in France Josephine's husband was executed and about two years later, on Mar. 9, 1796, she married Napoleon Bonaparte, who considered her his ablest adviser for 15 years. Josephine had no children by Napoleon, so that there was no lineal heir to the throne, and on Dec. 16, 1809, after painful scenes, the marriage was dissolved. During Josephine's life at the Tuileries she attracted the most brilliant society of France, but after her divorce she remained secluded, retaining the title of empress and sympathizing with Napoleon in his defeat. Had the allied forces been magnanimous enough, she would have rejoined him in his exile on St. Helena.

Joseph of Arimathaea (*ăr-ĭ-mă-thē'ă*), a member of the Jewish sanhedrin and the disciple who provided for the burial of Jesus. He was a believer in the teachings of Jesus Christ, but he did not profess his faith as courageously as did his contemporaries. The evangelists agree in the account that he came to Pilate to obtain permission to take the body of Christ and that he buried it in his own garden. According to Matthew, he was a councilor and rich in earthly goods. In traditional writings he is spoken of as a missionary to Gaul and Britain, and is reputed the builder of the first Christian oratory near the present site of Glastonbury, England.

Josephus (*jō-sē'fŭs*), FLAVIUS, Jewish historian, born in Jerusalem in 37 A.D. His lineal descent was in both the royal and priestly lines. Accordingly, he was carefully educated in Greek and Hebrew, which early developed his brilliant faculties, and at the age of 26 he was chosen delegate to Nero. When the last fatal trouble with the Romans began, Josephus was appointed governor of Galilee, and for 47 days of desperate resistance held the city of Jotapata against the advance of Vespasian. After the fall of the city, he remained a paroled captive for three years, and was present at the fall of Jerusalem in 70 A.D. From his autobiography we learn that he went to Rome and devoted himself to literary studies. He was married three times and is known to have survived Agrippa II, who died in 97, but his death is not recorded. However, it is assumed that he died in the year 100. Among his principal literary works are "History of the Jewish War," "Jewish Antiquities," and "Autobiography."

Joshua (*jŏsh'ū-ă*), Hebrew military and religious leader, son of Nun, of the tribe of Ephraim, and successor to Moses. He is first mentioned in the Old Testament for his defeat of the Amalekites in Sinai (Exodus 17:6-16). Chosen to succeed Moses as the leader of the Israelites, he led them out of Egypt, across the Jordan, and into Palestine. After conquering the greater part of central Palestine, he distributed the land to the 12 Tribes of Israel by lot, fixed boundaries, and apportioned cities. Toward the end of his life, he delivered a powerful sermon to the Hebrews at Shechem, exhorting them to be faithful to Jehovah. The Book of Joshua gives a full account of Joshua's leadership and the occupation of Palestine.

Josiah (*jō-sī'ah*), King of Judah, born about 647 B.C. He ascended the throne at the age of eight, after the assassination of his father, Amon, in 639. His reign was characterized by religious

reforms which were based on a Book of Law found in the Temple at Jerusalem and usually identified with Deuteronomy (II Kings 22:3ff.; II Chronicles 34:8ff.). Following the religious ideals set forth in these writings, Josiah burned all idols, purged the Temple of alien cults, and led his people in the worship of Jehovah (II Kings 23:4ff.). His long reign came to an end in 609 B.C. when he was slain at the Battle of Megiddo, in the Esdraelon valley, where he had gone to assist the Assyrians against the advance of the Egyptian Pharaoh (II Kings 22:1, 23:29).

Jotunheim (*yō'tōōn-hām*) or JOTUNHEIMEN or JOTUNFJELD, a chain of mountains in central Norway, containing the highest peaks in Scandinavia. It culminates in the Galdhöpiggen (8,097 ft. high) and the Glittertind (8,048 ft.). In Norse mythology the Jotunheim is the habitat of giants, who are known as the Jotun.

Joubert (*you'bĕrt*), PETRUS JACOBUS, statesman and soldier, born in Cango, Cape Colony, South Africa, Jan. 20, 1831; died in Pretoria, March 27, 1900. Descended from a family of Boers who had settled in South Africa in 1687, he migrated to the Transvaal at an early age, became a successful farmer, and studied law. Joubert soon became a major political and military leader of the Boers in their struggle against British encroachment in South Africa. He was acting president of the Transvaal Republic (1875), routed the British from the Transvaal (1880-81), and, with S. J. P. Kruger and M. W. Pretorius, was a member of the triumvirate that ruled the Transvaal from 1880 to 1883. Thereafter, he ran unsuccessfully against Kruger for the presidency. When war again broke out with Great Britain (1899), he assumed command of the Boer army but soon retired because of ill health.

Jouett (*jōō'ĕt*), MATTHEW HARRIS, painter, born in Mercer County, Kentucky, April 22, 1788; died in Louisville, Ky., Aug. 10, 1827. After an initial military career and service in the War of 1812, he studied (1816) with Gilbert Stuart (*q.v.*) in Boston. Thus indirectly influenced by the great European portrait painters, from Van Dyck to Reynolds, he devoted his work mainly to portraiture. Best known of such paintings are portraits of John Grimes and the Marquis de Lafayette.

His son JAMES EDWARD JOUETT (1828-1902) was an outstanding Navy officer, who served in the Civil War under Adm. Farragut and was made rear admiral in 1886.

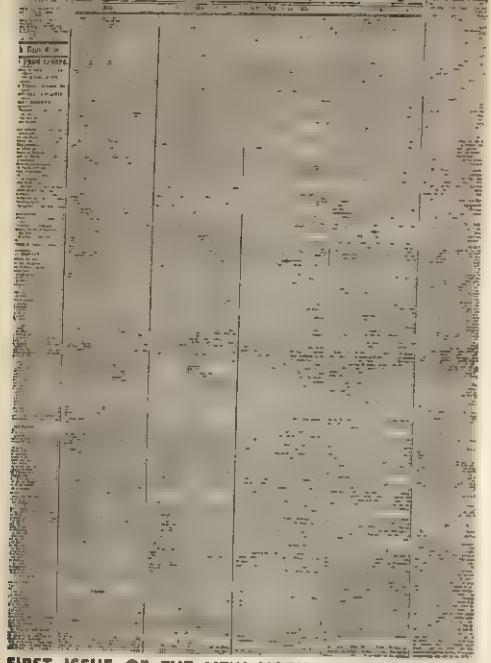
Jouhaux (*zhōō-ō'*), LÉON, trade-union leader, born in Paris, France; July 1, 1878; died in Paris, April 28, 1954. Starting work in a match factory at the age of 16, Jouhaux early became a trade unionist. In 1909, he was elected treasurer and a few months later secretary-general of the Confédération Générale du Travail (C.G.T.). He held this post for nearly 40 years, interrupted only by the German occupation during World War II, when the C.G.T. was dissolved and Jouhaux was interned in a German concentration camp. A revolutionary in his youth, he turned to evolutionary Socialism during World War I. In 1947, he organized the Force Ouvrière (Workers' Force), an anti-Communist labor group, and, in 1949, he founded the International Confederation of Free Trade Unions. In 1951 he was awarded the Nobel Prize for peace.

Joule (*jowl*), JAMES PRESCOTT, physicist, born in Salford, England, Dec. 24, 1818; died in Sale, Oct. 11, 1889. He received some instruction in chemistry from John Dalton but was otherwise self-taught. A gifted experimenter, he did much to establish the principle of conservation of energy (Joule's Law), by showing the quantity of heat generated in an electric circuit to be a function of the current flowing through it. Later he showed the convertibility, at a fixed "rate of the exchange," of heat and mechanical work. A unit of work, the joule, was named in his honor, 4.18 joules being equivalent to one calorie. His papers include "On the Production of Heat by Voltaic Electricity" (1840) and "The Calorific Effects of Magneto-electricity and the Mechanical Value of Heat" (1843). See also *Thomson, William; Unit.*

Jourdan (*zhōōr-dăṅ'*), JEAN BAPTISTE, marshal, born in Limoges, France, April 29, 1762; died in Paris, Nov. 23, 1833. He was the son of a surgeon and studied for the army and in 1778 fought under Count d'Estaing in the war for American independence. In 1784 he returned to France and later distinguished himself in the wars resulting from the French Revolution. In 1800 he was made governor of Piedmont by Napoleon I, and Louis XVIII made him a count. He was minister of foreign affairs during the July Revolution (*q.v.*).

Journalism (*jûr'nəl-ĭzm*), the profession of transmitting to the public news and views of current interest. It includes reporting and interpreting the facts and events of the contemporary scene on a periodical basis—hourly, daily, weekly or monthly. The primary function of journalism is "to communicate to the human race what its members do, feel, and think." To fulfill its task journalism utilizes the chief media of mass communication. These media include the printed word, in the daily and weekly press and in pamphlets and magazines, and the spoken word, through various channels such as radio, the newsreels, travelogues, and documentaries of the cinema and television.

Journalism has four principal reasons for being: to inform, to interpret, to guide, and to entertain. Of these the primary one is to spread the news. In nontotalitarian countries the dissemina-



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tion of news carries a guarantee of a free press and free speech—free from any compulsions, governmental, economic, or social. In return for these guarantees the media of journalism have implicitly accepted obligations adherent to its high calling: independence, fairness, accuracy, honesty, objectivity, and responsibility.

The principal medium of journalistic communication is the printed word through the newspaper. Its chief function is in furnishing news to readers. In conjunction with this has developed, in a manifold and complex society, a need for interpreting and explaining the news, so that news stories are now accompanied by explanation, background material, interpretation, maps, illustrations, and diagrams. Side by side with its news reporting and editorials has been journalism's function of entertainment through "human interest" stories of everyday life, humorous anecdotes, crossword puzzles, etc.

Journalism began when man learned to write; the newspaper began when mankind recorded events at regular intervals. Man first scratched his symbols on walls of caves, later on papyrus; over the centuries, he recorded his thoughts, through the development of printing, until he could make use of the great papers of today. Early writings dealing with timely topics were the *Acta Diurna* or Daily Acts that Julius Caesar, about 50 B.C., had posted publicly each day in the Forum at Rome. This precursor of the newspaper gave information and carried news—the activities of the Roman Senate. The *Acta* also had a propaganda impact on the actions of the Roman senate. Emperor Augustus also used the *Acta* and published "features" praising Romans with large families. These were the early newsletters, prototypes of today's newspaper. In fact the first continuing American newspaper, which John Campbell published in Boston from 1704 to 1722, bore the name *News-Letter*. Even today, in a form of journalism particular to the U.S. there are some 35 Washington newsletters, interpreting and forecasting events and conditions.

Journalism is, nevertheless, one of the younger professions, for up to the latter part of the 18th century gazettes, courants, and newsbooks flourished rather as adjuncts of politics. The first stage in the professional evolution of journalism was the American Revolution, which completely unfettered the press. The American press had developed fast from the first American newspaper, Benjamin Harris' *Publick Occurrences Both Foreign and Domestick*, which put out only one issue (Sept. 25, 1690). By 1776 the American Colonies had 37 newspapers. By the 1830's the newspapers had broken away from support of political groups. This came about through the development of the penny press, enabling the masses to become newspaper readers. The 19th century also brought forth great molders of opinion and great newspapers—James Gordon Bennett of the New York *Herald*, Horace Greeley of the New York *Tribune*, William Cullen Bryant of the New York *Evening Post*, Charles A. Dana of The New York *Sun*, Henry J. Raymond of The New York *Times*, and Joseph Pulitzer of the St. Louis *Post-Dispatch*.

Today journalism has grown up to a high calling with an array of editors, reporters, and far-flung correspondents of an infinite variety of knowledge and skills. Business and mechanical forces parallel the editorial staffs. Newspapers have become compendiums of news from thousands of sources, plus interpretative, cultural, and entertainment features. In the U.S. there exist currently some 14,000 papers, 1,800 of them dailies, with an aggregate circulation of about 55,000,000. New York City is the newspaper center of America, with 35 English-language daily papers—regular, tabloid, and business. The tabloid New York *Daily News* has the biggest U.S. circulation—2,700,000 daily and 4,000,000 on Sunday. The outstanding American newspapers are generally considered to be the *Times* and the *Herald Tribune* in New York City, the St. Louis *Post-Dispatch*, the *Christian Science Monitor* of Boston, the Washington *Post*, the Baltimore *Sun*, the Cleveland *Plain-Dealer*, the Milwaukee *Journal*, and the Kansas City *Star*.

As news became more complex and the telegraph took over from boats, carrier pigeons, and pony express, six newspapers in 1848 banded together on a cooperative basis to collect news. This was the inception of the Associated Press (*q.v.*), which today serves more than 4,000 news media around the world on a nonprofit, coopera-

tive basis. Until 1958, there was also United Press, founded by E. W. Scripps in 1907, which sold its news-gathering service to 3,300 media, and International News Service, which served primarily the Hearst newspaper chain. In 1958 these two services merged to become United Press-International. These news services, plus the British Reuters (the oldest in its field), and numerous others have enabled the American press, radio, and other media of communication to provide almost instant world coverage.

Journalism has developed professional schools of great standing. There are about 40 schools of journalism in the U.S. Among the most famous are the Graduate School of Journalism of Columbia Univ., the School of Journalism of Missouri Univ., and the Medill School of Journalism of Northwestern Univ. See also *Newspapers; Periodicals; Press, Freedom of the; Yellow Press.*

Journeyman (*jûr'nĭ-mān*), in the Middle Ages, an artisan who worked with a master for wages. He was further advanced in the practice of his craft or trade than the apprentice (a beginner who received no wages). Before the journeyman was considered an independent master, he had to create a "masterpiece," a complicated work within his field of competence. These classifications are still used today in the building industry and a few others.

Jouvenet (*zhōōv-nā'*), JEAN, painter, born in Rouen, France, Aug. 21, 1647; died in Paris, April 5, 1717. He came from a family of painters and went to Paris at an early age, where his talent won him a professorship at the Académie Royale. Jouvenet is known as a painter of religious themes. His "Miraculous Draft of Fish" and other canvases hang in the Louvre (Paris).

Jovian (*jō'vĭ-ən*), full name, FLAVIUS CLAUDIUS JOVIANUS, Roman emperor (363-364), born in Moesia *ca.* 332; died in Dadastana, Bithynia, in Asia Minor, Feb. 17, 364. He was Julian the Apostate's commander during the Persian campaign. On the death of Julian, he was elected emperor and concluded a humiliating treaty with the Persians, whereby he ceded five Roman provinces and other territories. As emperor, his chief act was to restore to the Christians the rights granted to them by Constantine.

Jowett (*jou'ĭt*), BENJAMIN, classicist and theologian, born in Camberwell, London, England, April 15, 1817; died Oct. 1, 1893. One of England's great educators and classical scholars, he was professor of Greek at Oxford Univ. after 1855 and master of Balliol Coll. (after 1870). He is best known for his translations of Plato (4 vols., 1871), Thucydides (2 vols., 1881), and Aristotle's "Politics" (1885).

Jowitt (*jow'ĭt*), WILLIAM ALLEN, 1ST EARL JOWITT, jurist, statesman, born in Stevenage, Herts, England, April 15, 1885; died near Bury St. Edmunds, Aug. 15, 1957. He studied at Oxford and was admitted to the bar in 1909. He was a Liberal member of Parliament (1922-24); later joining the Labour party, he was attorney general in 1929-31. Jowitt served under Winston Churchill (1940-45) and Clement Attlee (1945-51) and was made an earl in 1951. His book "The Strange Case of Alger Hiss" (1953) aroused general controversy.

Joyce (*jois*), JAMES, writer, born in Dublin, Ireland, Feb. 2, 1882; died in Zurich, Switzerland, Jan. 13, 1941. After studying theology, philosophy, and languages at Belvedere Coll. and Dublin's Royal Univ., he broke with the Catholic Church, left Ireland, and lived the remainder of

JAMES JOYCE

Sketch by Augustus John

his life in self-imposed exile on the Continent. Yet, it was his Jesuit training and the life of his native Dublin that were to recur as constant themes in his writings. While devoting most of his time to writing in Switzerland, Trieste, and Paris, he supported his family by teaching languages.

Joyce's writings include two volumes of poetry, "Chamber Music" (1907) and "Pomes Penyeach" (1927). His collection of short stories, "Dubliners" (1914), foreshadowed the autobiographical novel "A Portrait of the Artist as a Young Man" (1916) and its sequel "Ulysses" (1922). His last novel was "Finnegans Wake" (1939). In addition, he wrote a three-act play, "Exiles" (1918).

When Joyce's writings first appeared after World War I, they were heralded by a storm of controversy. Since then, Joyce, together with Marcel Proust (*q.v.*), has probably had a greater influence on world literature than any other writer. It is Joyce who is considered the originator of the literary technique known as the stream of consciousness (*q.v.*). In this way, individual

and entirely arbitrary associations of thoughts and imaginations are mirrored, not always understandably. In his later works, Joyce even went so far as to use simple vowels and onomatopoetic sounds, relying on the imagination and associations of the reader to supply the necessary thread of meaning. Some of his followers used this method to such a degree that their writings have only individual meaning and communicate very little to the reader.

Juan Fernandez (*hōō-än' fĕr-nän'dĕth*), an island about 400 m. off the coast of Chile, to which country it belongs. The island was discovered in 1574 by a Spaniard whose name it bears. It is about 13 m. long and 4 m. broad, rocky, mostly high, but with some parts fertile. The chief products include cereals, cherries, peaches, figs, apples, grapes, melons, etc. It is famous on account of the story of Robinson Crusoe written by Daniel Defoe (*q.v.*), which is thought to be founded upon the solitary confinement and residence of Alexander Selkirk (1676-1723), a Scotch pirate, on the island of Juan Fernandez. He quarreled with the captain and at his own request was put off on the island, where he lived on fruit and wild goats for four years. The island is at present occupied by a number of small Chilean settlements.

Juárez (*hwä'râs*), BENITO PABLO, lawyer and statesman, born in Guelatao, Oaxaca, Mexico, March 21, 1806; died in Mexico City, July 18, 1872. An Indian, Juárez was educated for the law. He practiced (1834-46) in the State of Oaxaca, of which he was elected governor in 1847. Banished upon the return of Gen. Antonio López de Santa Anna (*q.v.*) in 1853, Juárez returned to Mexico during the revolution of Ayutla, a town in southern Mexico, in 1855. He was a member of the liberal group which included Juan Álvarez (1790?-1867), Ignacio Comonfort (1812-63), and the brothers Miguel (1814?-61) and Sebastián (1825-89) Lerdo de Tejada, major figures in one or another of the republican governments of the next 15 years. Juárez, as minister of justice in 1856, was responsible for the Juárez law, which curtailed military and clerical privileges and reformed court practices. The Lerdo law of the same year instituted the forced sale of Church properties. Chosen acting president in 1858, Juárez was unable to take office because the conservatives had seized the government; the War of the Reform (1858-61) followed. After the liberals won, he was regularly elected in 1861, but he was again forced to flee by the French invasion and occupation under Maximilian (*q.v.*). Juárez withdrew with his government to the northern frontier. When the empire collapsed, he was re-elected president in 1867. His administration tried to put into force all of the liberal reforms, but opposition made them

BENITO P. JUÁREZ

ineffectual. Re-elected in 1871, he was facing an insurrection when he died.

Jubilee (*jū'bĭ-lē*), a festival celebrated by the Jews every 50th year, the year succeeding every seventh sabbatical year. During this year all slaves were set at liberty, all lands lay fallow, and all estates that had been sold reverted to the heirs of the original owner, to whom the land had been parceled out in the time of Joshua. The design of this institution was to check the rise of any great inequality of social conditions, and to prevent the rich from oppressing and enslaving the poor. It strengthened the bonds of families and bound the people to their country, by leading them to cherish an affection for estates derived from their ancestors and to be transmitted to their posterity. It was observed both before and after the Babylonian captivity, but ultimately fell into disuse.

Judah (*jōō'dȧ*), the fourth son of Jacob and Leah, the progenitor of the most numerous of the 12 tribes of Israel. When Joshua divided the land west of the Jordan, the portion extending south from Jerusalem to the boundary of the Amalekites, and between the Dead Sea and the Mediterranean, was allotted to the tribe of Judah. The royal house of David and Jesus Christ were descendants of Judah. See *Jews.*

Judaism (*jōō'dȧ-ĭz'm*), the sum total of the historic religious-national philosophy and experience of the Jewish people, as expressed in their sacred literature and developed during the centuries of their existence. Correctly descriptive of the Jewish way of life derived from their religion, the designation is popularly and commonly used in the narrower sense to designate the religion itself. The term was first introduced by Greek-speaking Jews to distinguish their civilization from the way of life known as Hellenism practiced by the surrounding pagans.

The cardinal principle of the theology of Judaism is pure monotheism, which arose out of rebellion against idol worship, and there has been no deviation in Judaism's historic rejection of any religious form which projects the deity of other beings as co-existent with God. Judaism likewise emphasizes the sanctity of the personality and the worth of the individual, a principle which reached full political maturity only in comparatively recent times, under democracy. Indication of Judaism's emphasis on the equality of all men before God may be found in the status of the rabbi. He is a teacher or guide or scholar, but possessed of no special privileges as a spokesman of his people. No spokesman is needed, for all Jews, through prayer, have the same free access to God. The nature of man's distinctiveness from animals, first understood by the founders of the Jewish faith, and the characteristic which affords him a personality status, are what are known variously today as soul, or intelligence. Jewish tradition explains the apparent anomaly of the "likeness of God" expression as indicating that man is made in the image and likeness of God on the level of intelligence, as well as of ethical morality. There is consequently a rejection of the theory of original sin (*q.v.*), and an emphasis on the freedom of man's will.

On this basis of the unity of God and the dignity of man, Judaism has developed a philosophy of life deriving its authority both from that basis, which may be termed the original law from Sinai, as embodied in the Torah, and from an ensuing developing chain of tradition, which constitutes an interpretive and defensive "fence" around the Torah.

It should be made clear that Judaism is not merely a theology or a creed; it represents a complete philosophy and way of life. There can be no dichotomy between faith and moral practice, and while prayer and observance of ritual are of value, supreme importance is attached to the practice of the good and just life, and to ethical and righteous conduct. Because of this permeation of Judaism into the entire life of the people, there arose during the course of the centuries a complete internal social and civil law, drawing inspiration and authority from divine sources, and amplifying the nature of Judaism as the religio-national way of life, or civilization, of the Jewish people. These aspects of Judaism find expression in the peoplehood of Israel, a concept which has been nourished by the ages-old longing of the Jews to re-establish a center of their group life in Palestine, as well as in the role of the Jews as a religious community, bearing the original message of the unity of God and the dignity of man. It is in the latter sense that the term "Chosen People" is used in Jewish tradition, in the sense of being chosen as living witnesses of the ideals of monotheism and the ethics of morality.

The development which Judaism has undergone has been marked, and may be observed in distinct periods of the history of the Jewish people. Briefly, it may be noted that in patriarchal times the emphasis was on the oneness of God. In the prophetic period there emerged the concept of ethical monotheism, and later an encrusted theocratic system ensued, which was shattered by the Exiles. The system of Jewish tradition developed by rabbinic scholarship in the Exilic and Post-Exilic periods, as embodied in the Talmud, is largely composed of clarification of the Torah and intensified application of the influence of Judaism to the daily life of the Jew, covering such widely diverse matters, in addition to worship and ritual, as manners, personal cleanliness, disputes of varied nature, torts, marital relationships—in short, an entire code of human behavior.

Judaism as it has emerged today is the product and result of periodic ideological conflicts between groups which sought to interpret or alter Jewish tradition in one manner or another. The historic dispute between the Pharisees (*q.v.*) and the Sadduccees (*q.v.*) was one essentially of democracy against a priestly autocracy, in which the democratic tradition, carried by the Pharisees, was triumphant. Beginning in about the ninth century, the Karaites (*q.v.*) challenged the validity of rabbinic Judaism, and called for a return to the literal teachings of the Hebrew Scriptures. Once a powerful and active group in Jewish life, the Karaite sect made its influence felt, but was unable to weaken the influence of rabbinic Judaism and the development of Jewish religious traditions. Other movements as well played their role in the evolution of Judaism. In medieval times the horizon of Jewish philosophy was broadened considerably as a result of the studies and writings of men like Maimonides and his contemporaries. In the latter Middle Ages the mystical Cabbala movement, and much later, in the 18th century, Hasidism, attracted considerable popular support, and played their role in influencing the development of the chain of Jewish tradition. In modern times the development of Judaism has largely been affected by external political and social conditions, beginning with the Enlightenment and the Emancipation, and continuing to our own day.

In the U.S. today Judaism finds expression in three forms which accept certain basic fundamentals in common. The unity of God, the dignity of man, the authority of the Hebrew Bible and of rabbinic Judaism are in large measure recognized by these groups, though there are differences in practices and in interpretation. *Orthodox* or *Traditional Judaism* stands fast on the chain of tradition which dictates Jewish custom and be-

lief. *Conservative Judaism,* also known as *Historic Judaism,* seeks to adapt and re-interpret religious practices of Jewish life in accord with historic trends, without molesting the principles of tradition. More radical is *Reformed* or *Liberal Judaism,* a product of the Enlightenment (*q.v.*), which minimizes ritual, narrows the chain of tradition, and emphasizes the ethical monotheism of prophetic teachings to the exclusion of Post-Exilic Talmudic teachings and practices. See also *Jews; Palestine; Zionism.*

Judas (*jōō'dąs*), SAINT OR SAINT JUDE, one of the Twelve Apostles and a brother of Jesus. Evidently he and his other brothers (Mark 6:3) misunderstood the teachings of Jesus until after the Resurrection, when he became a preacher and suffered martyrdom in Persia. It is believed that he is the author of the Epistle of Jude (*q.v.*). His feast day is Oct. 28. References to him in the Bible can be found in Mark 3:31; John 7:5; 19:26, 27; Acts 1:14; I Corinthians 9:5.

Judas Iscariot (*is-kăr'i-ŏt*), one of the Twelve Apostles and the betrayer of Jesus. A native of Kerioth, Judea, he was steward of the disciples, but was known to be avaricious and dishonest. For 30 pieces of silver he betrayed Jesus to the priestly authorities, and, in a fit of horrible remorse, he committed suicide by hanging. (Matthew 26:20-25, 47-49; 27:3-10; Acts 1:16-20.)

Judas Maccabaeus (*jōō'dąs măk-ą-bē'ŭs*). See *Maccabees.*

Judd (*jŭd*), CHARLES HUBBARD, psychologist and educator, born in Bareilly, India, Feb. 20, 1873; died in Santa Barbara, Calif., July 18, 1946. He was brought to the U.S. as a child; he attended Wesleyan Univ. and the Univ. of Leipzig in Germany (Ph.D., 1896). Known for his work in education and educational psychology, he taught at Yale Univ. (1904-09) and served as chairman of the education department at the Univ. of Chicago (1909-38). His books include "Introduction to the Scientific Study of Education" (1918) and "Educational Psychology" (1939).

Judd, ORANGE, journalist, born near Niagara Falls, N.Y., July 26, 1822; died in Chicago, Ill., Dec. 27, 1892. He was educated at Wesleyan Univ., taught school for three years, and in 1850 took up the study of agricultural chemistry at Yale. In 1853 he became joint editor (later editor and publisher) of the *American Agriculturist,* an influential farm journal, in which Judd advocated the percentage system of crop reporting, later adopted by most countries. He established the first agricultural experiment station in the U.S. at Wesleyan Univ., where he also built the Orange Judd Hall of Natural Science.

Jude (*jūd*), EPISTLE OF, a book of the New Testament. Although its authorship and date are obscure, it is believed to have been written by St. Judas (*q.v.*), but it was known in the latter half of the 1st century. The Epistle admonishes those who pervert God's offer of free grace into an excuse for immoral living and warns true Christians against heretics and false teachers.

Judea (*jū-dē'ą*) or JUDAEA, the ancient name of the southern division of Palestine under Persian, Greek, and Roman rule, bounded on the N. by Samaria, on the E. by Jordan and the Dead Sea, on the S. by Idumaea, and on the W. by the Mediterranean. During the time of Christ, it was included in the province of Syria and was, at the same time, a kingdom ruled by the Herods. See *Palestine.*

Judge (*jŭdj*), an officer who has authority to hear and determine causes at law. The term is sometimes used interchangeably with *justice,* or *lord justice,* and extends to the presiding officer in courts of equity, civil, and criminal law. Although a justice of the peace is in a certain sense a judge, the term applies more properly to the judges of city, county, district, circuit, and supreme courts.

In the U.S., Federal judges are appointed by the President, subject to confirmation by the Senate, and serve for life. On the other hand, most states follow the practice of electing their judges by popular vote. A few states, however, select their judges either by legislative appointment or by executive nomination, subject to legislative concurrence. Among the 48 states, judgeship terms vary widely—from 2 years in Vermont to 21 years in Pennsylvania. Justices attached to city and county courts are elected, although higher echelon judges are usually selected by executive appointment.

Judges (*jŭd'jęs*), BOOK OF, the eighth book of the Old Testament. It is so named because it narrates the deeds of leaders who are said to have "judged" Israel. Though fragmentary and somewhat disconnected, it gives a reasonably full account of Deborah and Barak, Gideon, Jephthah, Samson, Eli, and Samuel. The book describes the calamities suffered by the Hebrews after the death of Joshua and attributes them to the Hebrews' apostasy from Jehovah.

Judgment (*jŭj'mĕnt*), in logic and psychology (*qq.v.*), an act of thought by which something is evaluated or interpreted, in terms of an idea or concept derived from past experiences. The process of thinking, therefore, consists of units of judgments linked by rational ties. See also *Reason.*

In courts of law, judgment refers to the decision of a judges' court, as well as to the decree of a judge following the verdict of a jury. See also *Judiciary.*

Judgment Day or DOOMSDAY, in theology, the day on which God will pronounce judgment on all men. The prophecy of a Judgment Day is

found in the Jewish, Christian, and Mohammedan religions. According to the Christian concept, which derives from the New Testament, the world will come to an end, the dead will be resurrected, and Christ will return to take the righteous into Heaven and to cast the sinners into Hell.

Judiciary (*jū-dĭsh'ĭ-ĕr-ȳ*), the body of judges comprising the judicial structure of a government. In the U.S., the Federal judiciary consists of the Supreme Court (*q.v.*), 11 circuit courts of appeals, more than 90 district courts, courts of claim, courts of customs and patent appeals, territorial courts, and consular courts. The judiciary is hierarchically organized, so that, in cases of error, judgments of lower courts may be appealed to courts of higher authority; the Supreme Court is the final arbiter. See also *Court; Judge.*

Judith (*jū'dĭth*), a heroine of the ancient Jews, of whom an account is given in the book of the Apocrypha that bears her name. She was of the tribe of Simeon, the widow of Manasseh, and is celebrated for delivering the city of Bethulia from Holofernes, the commander of an Assyrian army.

Judson (*jŭd'sŭn*), ADONIRAM, missionary, born in Malden, Mass., Aug. 9, 1788; died at sea, April 12, 1850. Ordained a Congregational minister in 1812, he was a founder of the American Board of Commissioners for Foreign Missions. Following his conversion to the Baptist faith, he went to Burma for the Baptist Missionary Union. One of the pioneers in Protestant missionary work in Asia, he spent *ca.* 30 years among the Burmese, returning to the U.S. in 1845. Judson translated the Bible into Burmese in 1835 and, in 1849, published a Burmese-English dictionary.

Juggernaut (*jŭg'gĕr-nôt*). See *Jagannath.*

Jugoslavia (*jōō-gō-slăv'i-ȧ*). See *Yugoslavia.*

Jugular Vein (*jŭg'ū-lĕr vān*), in human anatomy, the name of a group of four veins, situated on each side of the neck and serving to return to the heart most of the blood from the head and neck. The *external jugular* receives blood from the upper and back part of the neck through the *posterior external jugular;* through the *anterior jugular,* it receives blood from the deep structures of the neck and face. The *internal jugular,* beginning at the base of the skull, collects blood from the brain, depths of the skull, and superficial parts of the face and neck.

Jugurtha (*jū-gûr'thȧ*), King of Numidia, grandson of Masinissa, born *ca.* 156 B.C.; died in Rome in 104 B.C. On the death of his uncle, Micipsa, he and Micipsa's two sons inherited the kingdom of Numidia. Politically ambitious, Jugurtha eliminated his cousins and united the kingdom under his sole rule. This act resulted in war with Rome which lasted from 111 to 106 B.C., and in the course of this war Jugurtha met his defeat. He died in a Roman prison.

Juilliard School of Music (*jōōl'yärd*), a co-educational institution for the training of professional musicians. Located in New York City, the school, which was chartered in 1926, is controlled by a private foundation established through a bequest of Augustus D. Juilliard (1836-1919). It includes in one unit the former Juilliard Graduate School (1924-46) and the former Inst. of Musical Art (1905-46), the latter founded by Frank Damrosch and James Loeb. The school grants bachelors' and masters' degrees in music. Annual enrollment is about 750.

Jujitsu or JUJUTSU. See *Jiujitsu.*

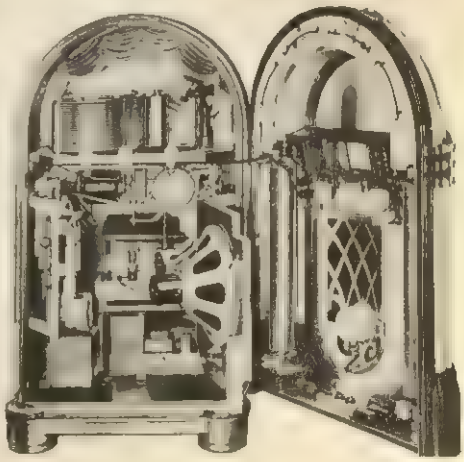
Jujube (*jōō'jōōb*), the name of a small tree and its fruit, botanically *Ziziphus jujuba,* in the buckthorn family, which has been cultivated for a long time in China, southern Europe, and more recently in the southern U.S. The olive-sized fruit is eaten fresh, dried, or boiled with sugar, and the seed may be used as a nut.

Juke Box (*jōōk bŏks*), colloquial U.S. name for the commercial phonograph, an automatic, electrical, coin-operated amusement device for the reproduction and amplification of sound from disk-type records. The derivation of the term is obscure; its probable place of origin is the Southern U.S., although one theory holds that it derives from the name of a Swiss music-box firm, Julius Juke und Söhne. The juke box is usually found in public places such as restaurants, bars, dance halls, skating rinks, and excursion boats. The average juke box offers a choice of 24 musical selections, chiefly popular songs.

The constituent units of a juke box are the coin mechanism, record-selector system, record-storage and playing devices, sound-reproduction system, and the case or cabinet.

INTERIOR OF A JUKE BOX

Courtesy Wurlitzer, N. Y.



The *coin mechanism* consists of a coin entry, a selector device to detect and eject counterfeit coins, an accumulative device which registers coins and controls the number of plays, switches for closing operational circuits, and a receptacle for the coins. The *record-selector* system is an electrically controlled means to select or re-play individual records. *Record-storage* devices may be trays on which the records rest horizontally, or racks which hold the records in a vertical position. The *record-playing* device is composed of a conventional record turntable. The *sound-reproduction* system consists of a pick-up, amplifier, speaker, and volume and tone controls.

The field of coin-operated, automatic music machines was pioneered by the music box. A Swiss development, music boxes originally utilized pin-studded cylinders for the production of sound, but these were eventually supplanted by perforated steel disks developed in Germany in 1886. Some time before 1895 music boxes were adapted to coin operation. By 1910, the music box had given way to the coin-operated player piano, which first appeared about 1895 and dominated the commercial automatic music field until the 1920's. The first coin-operated phonographs appeared about 1892. By 1928, electrical amplification and satisfactory record selectors had been perfected and the era of the modern juke box had begun. Until 1934, the juke box industry was small. Then the juke box caught the public fancy and the industry expanded with amazing rapidity. Today it is a multimillion dollar business.

Jukes (*jōōks*), a New York State family investigated in 1875 for criminal research reasons. Since 1800, 140 out of 709 members of this family had been criminals and 280 had been paupers. The name Jukes is a substitution for the real name of the family, famous in the annals of criminal history.

Julep (*jōō'lĕp*), in medicine, a refreshing drink flavored with aromatic herbs. It is a sweet, soothing liquid and is used chiefly as a vehicle. The name is likewise applied to a beverage, popular in the Southern U.S., composed principally of whisky or some other spirituous liquor. A drink made with brandy or whisky and mixed with sugar and sprigs of mint is called a *mint julep*.

Julian (*jōōl'yăn*) (FLAVIUS CLAUDIUS JULIANUS), Roman Emperor, also known as Julian the Apostate, born at Constantinople in 331 A.D.; died July 26, 363. A son of Julius Constantius—half-brother to Constantine the Great—he was appointed Caesar by Emperor Constantius II (355). Entrusted with the defense of Gaul against the Germans, he defeated the Alemans at Strasbourg in 357, and three years later, the troops acclaimed him Augustus. He was killed at Ktesiphon, during a successful campaign against the Persians. Although educated in the Christian faith, he was deeply influenced by Neo-Platonism and confessed publicly his conversion to paganism (361).

Juliana (*jōō'lē-ä-nạ*), LOUISE EMMA MARIE WILHELMINA, Queen of The Netherlands, born Apr. 30, 1909. Juliana was taught privately until 1927 when she entered the Univ. of Leyden. The same year she was also made one of the 14 members of the Council of State, a group appointed by her mother, Queen Wilhelmina (*q.v.*), to act on certain legislative and executive matters. From 1931-36, Juliana served as chairman of the National Crisis Committee formed to investigate relief and rehabilitation measures. In January 1937, she married Prince Bernhard of Lippe-Biesterfeld, a German who became a Netherlands citizen before the marriage. Two days in advance of The Netherlands' surrender to the Germans (1940), Juliana and her two daughters escaped to England, while her husband joined the British and Dutch troops engaged in the final fight to sustain France. Juliana later went to Canada, where she spent the rest of the war years, but returned with her family to The Netherlands after the liberation of her country in 1945. In 1948 she became Queen of The Netherlands, succeeding Wilhelmina who abdicated.

Julius (*jūl'yŭs*), the name of three Popes of Rome, who reigned between 337 and 1555. The most notable of these is *Julius II*. He was born at Albisold Marina in 1443; died Feb. 21, 1513. Julius II occupied the papal throne from 1503 until his death. It is said of him, "He made his tiara a helmet and his cross a sword."

Jullundur (*jūl'ẹn-dēr*), or JALANDHAR, a city in India, capital of a division and a district of the same name, in the state of Punjab, located 75 m. S.E. of Lahore, Pakistan. A rail, road, and commercial center, with varied light industries, it is the seat of a section of the Punjab Univ. and its colleges of law and commerce. The city dates from an early period in the history of Asia. Population, 1951, 168,816.

July (*jōō-lī'*), the seventh month in the Gregorian calendar, but formerly the fifth month of the year, when it was called Quintilis. It has 31 days and is so named in honor of Julius Caesar, who was born on the 12th day of July.

July, COLUMN OF, the name of a memorial erected in Paris, France, to commemorate those who fought for the liberty of that country on July 27, 28, and 29, in the year 1830. It is located in the Place de la Bastille, and on four bands that encircle the column are the names of 615 who fell in the revolution. Beneath the column are the vaults that contain their remains, together with those of the victims connected with the Revolution of 1848.

July Revolution, the revolution that overthrew the Bourbon dynasty and restored the house of Orléans to the throne of France. It occurred

in July 1830, in Paris, and was the means of giving the crown to Louis Philippe. The Bourbon dynasty had become unpopular through the reactionary policy of Louis XVIII and Charles X, and matters came to a climax when the latter undertook to interfere with the liberty of the press and to abridge greatly the right of franchise. By the July Revolution the influence of the clergy in the administration was removed. Contemporary revolts occurred in Poland and Belgium, the latter country gaining independence.

Jumping Bean (*jŭmp'ĭng bēn*), MEXICAN, or broncho bean, a native of Central and South America. The beans actually have a jumping movement produced by a larva in the interior of the seeds.

Jumping Frog (*frŏg*), a famous short story by Mark Twain (see *Clemens, Samuel*), written in 1867.

Jumping Mouse (*mous*). See *Jerboa.*

Junco (*jŭn'kō*), the name of several birds common to North America, from Mexico to Canada, sometimes called black snowbirds. The plumage is ashy above and nearly white below. The nests are built of grasses and rootlets on or near the ground, and are frequently lined with hair and feathers. Birds of this class move southward as far as the Gulf of Mexico in autumn, and in the spring migrate to the northern part of the U.S. and Southern Canada.

Junction City (*jŭngk'shŭn*), a city in northeastern Kansas, seat of Geary County, at the confluence of the Republican and Smoky Hill rivers, 60 m. w. of Topeka. It is served by the Union Pacific R.R. The surrounding area produces livestock, wheat, and sorghum grains; there are also deposits of sand and stone, and some oil. Adjacent to the city is Ft. Riley, a frontier post and first capital of Kansas, now a military reservation and site of the Army Ground General School Center. Junction City was settled in 1853 and incorporated in 1855. Population, 1950, 13,462; in 1960, 18,700.

June (*jŭn*), the sixth month in our calendar, so named from the Roman surname Junius. Formerly it was the fourth month and consisted of 26 days, to which four were added by Romulus. Numa took one day from it, but Julius Caesar again lengthened the month to 30 days.

Juneau (*jōō'nō*), capital of Alaska, in the southeast, on Gastineau Channel, 90 m. s. of Skagway and 900 m. N. of Seattle, Wash., by air. It is a port of entry and headquarters of the Alaska customs collection district; it is served by an international airport for seaplanes only and by Juneau Municipal Airport, 9 m. N. of the city. There is twice-weekly steamship service for freight, and passenger cruises in the summer. Nearby points of interest include Glacier Bay National Monument, Tongass National Forest, and Mendenhall Glacier Recreation Area, which contribute to Juneau's popularity as a summer and winter resort. The city is the seat of the Cathedral of the Nativity of the Blessed Virgin Mary. Juneau was settled in 1880 and named for Joe Juneau, one of its founders. It was incorporated in 1900 and made the capital of Alaska Territory in 1906. Population, 1950, 5,956; in 1960, 6,797.

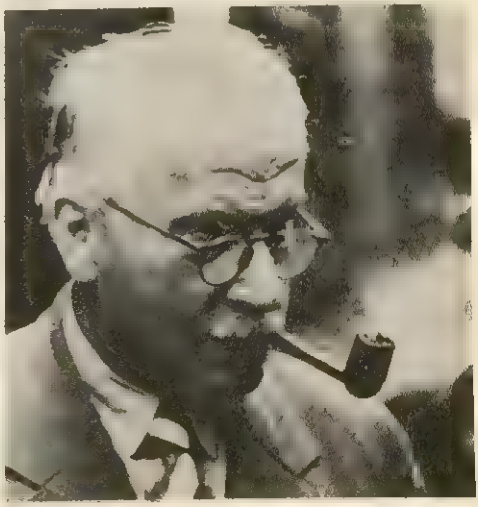
Juneau, LORENT SOLOMON, pioneer, born near Montreal, Que., Aug. 9, 1793; died in Shawano, Wis., Nov. 14, 1856. A trader in Green Bay, Wis., in 1821 he obtained a tract of land from the Indians and established the village of Milwaukee, of which he became first postmaster. Later he was the first mayor of the city of Milwaukee, where in 1887 a statue was erected in his honor in Juneau Park.

Juneberry (*jōōn'bĕr-ĭ*), the name of numerous species of trees and shrubs found in Canada and the U.S. Some are cultivated for their flowers and others for their fruit, also known as the juneberry, which is purple in color and about the size of a cranberry. The fruit of the juneberry is also known as the service berry and the mountain whortleberry.

June Bug (*bŭg*), OF MAY BEETLE, a large beetle common to North America. It is attracted by lamplight and often enters houses in the evening during early summer. When on the ground it is quite clumsy, but it flies swiftly through the air with a buzzing sound, and frequently strikes objects and falls from the stun received. The larvae are white grubs that injure the roots of grasses when numerous, and the adult beetles are harmful to the foliage of fruit and shade trees.

Jung (*yōōng*), CARL GUSTAV, psychologist and psychiatrist, born in Basel, Switzerland, June 26,

CARL JUNG



1875; died in Küssnacht, June 6, 1961. Beginning his career as a lecturer at the Univ. of Basel, Jung became known for his experiments in mental association and his development of the theory of complexes. He worked for years with Sigmund Freud (*q.v.*) but later disagreed with him on the question of the libido (*q.v.*), maintaining that it is the will to live, rather than a sexual impulse. Also in opposition to Freud, Jung believed that neurosis should be analyzed in terms of current problems rather than those of the past. He developed the theories of introversion (inhibition of emotions) and extraversion (manifestation of emotional states); and of the collective unconscious, which he postulated from the existence of mental patterns and the universality of certain symbols or symbolic habits. He also wrote extensively on psychology and psychiatry.

Jungfrau (*yōōng'frou*), meaning the maiden, a celebrated mountain of Switzerland, situated in the Bernese Alps. It has an elevation of 13,670 ft. above sea level. The peak is beautified by the presence of great snow deposits. It was first ascended in 1811. A railway line passes to the summit from Lauterbrunnen. A meteorological observatory is located at 11,729 ft. See also *Interlaken*.

Jungle (*jŭng'g'l*), originally a term used to describe any patch of uncultivated ground, now any impenetrable thicket or tangled mass of vegetation. During the Pacific phase of World War II, much of the actual warfare was maintained in the midst of thick jungles. Troops were specially trained and equipped to fight in these areas, being camouflaged and outfitted with insecticides. The most famous of these special fighting units was the group headed by Evans Carlson (*q.v.*), known as "Carlson's Raiders."

JUNGLE IN MALAYA

Courtesy British Information Services, N. Y.

Jungle Books, THE (*jŭn'g'l*), collective title of two volumes, "The Jungle Book" and "The Second Jungle Book," by Rudyard Kipling (*q.v.*), published in 1894 and 1895 respectively. Among the best loved of children's books, their literary qualities endear them to adults as well. The principal figure of the tales is the boy hero, Mowgli.

Jungle Fever. See *Yellow Fever*.

Jungle Fowl, a kind of bird native to the East Indies, one species (*Gallus gallus*) of which, the red jungle fowl, is regarded as the remote ancestor of barnyard poultry. The jungle fowl resembles domesticated fowl; the cocks crow and the hens cackle and cluck. Several allied species are native to India. The bird gained its name from the fact that it is found in large numbers in the jungles of that country.

Juniper (*jū'nĭ-pĕr*), a genus of hardy exogenous shrubs and trees, belonging to the cypress subfamily of the cone-bearing group. Twenty species are known, all of which are evergreen, and abound chiefly in the temperate and cold regions of both hemispheres. The common wild juniper is generally a shrub from 2 to 7 ft. high, but in rare cases attains the height of 20 to 30 ft. In this genus the leaves are awl-shaped and the flowers are whitish. The fruit is bluish-black, about the size of a currant, and requires two years to come to maturity. Within the fruit is a stone that yields oil of juniper, which constitutes a powerful diuretic, and the product of some species serves as a local irritant. The juniper tree found in Virginia is the red cedar of North America. It bears bright blue berries. Juniper trees often attain a height of from 25 to 50 ft. The wood is valuable for manufacturing lead pencils, cigar boxes, and cabinet products, and the berries of many species are used in flavoring gin.

Junius (*jūn'yŭs*), a signature affixed to 70 letters which were published between January 1769, and January 1772, in the *Public Advertiser*, in London, England. These letters became celebrated on account of the boldness with which various institutions, tendencies, and officials were attacked. Though the author never became known, public suspicion was fixed strongly on Burke and Viscount Sackville. It is now generally believed that the letters were written by Sir Philip Francis, but the evidence is wholly circumstantial. The most characteristic statement made by Junius to George III was: "Remember that while the crown was acquired by one revolution, it may be lost by another." Henry S. Woodfall,

the editor of the *Public Advertiser*, collected and published them in one volume. He was afterward prosecuted, but on some legal technicality escaped punishment.

Junk (*jŭnk*), a Chinese vessel used in navigating their seas, but which has served for voyages extended to America and Europe. It is the largest of the Chinese vessels and has no prominent stem or keel. The bow on deck is square, the stern is full, and the rudder extends beneath the bottom of the vessel. The sails are usually of matting and stretched on large center masts.

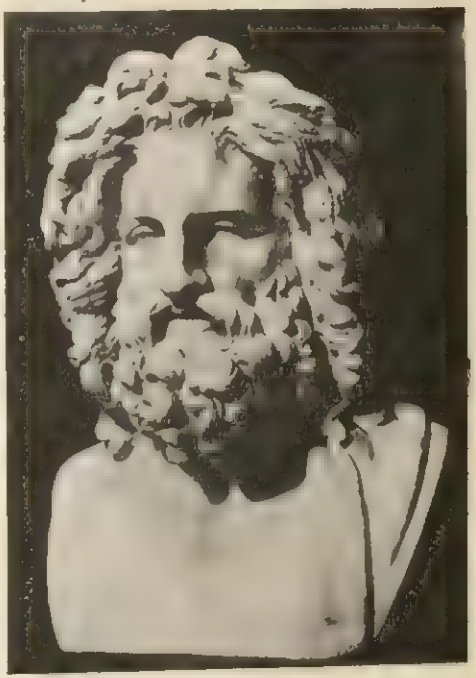
Junker (*yōōn'kĕr*), German word applied to a member of land-owning noble class, especially of Prussia, though commonly extended to representatives of this class throughout Germany.

Juno (*jū'nō*), the Roman divinity identical with the Greek Hera (*q.v.*).

Junot (*zhü-nō'*), ANDOCHE, Duke of Abrantès, marshal of France, born in Bussy-le-Grand, France, Oct. 23, 1771; died July 29, 1813. In 1792 he entered the army as a volunteer and became distinguished by energetic service in the wars of the republic. Having attracted the attention of Napoleon, he was engaged for service in the expedition to Egypt, and defeated 10,000 Turks at Nazareth. Later he served in the army sent to Portugal and succeeded in conquering the principal fortifications for France. These successes caused Napoleon to make him Duke of Abrantès and governor of Portugal. Wellington defeated him at Vimeiro, causing him to lose all advantages in Portugal, but he subsequently served in Germany, Spain, and Russia. The disaster at Moscow caused Napoleon to disgrace him on a charge of carelessness, but he soon after sent him as governor to Illyria. These and other difficulties brought about a derangement of his mind, and he died from the wounds inflicted in an attempt to commit suicide.

Junta (*jŭn'tä*), the Spanish name given to legislative assemblies and administrative councils. The assemblies of the representatives of the nation called by the monarch in the Middle Ages were termed general juntas, and Charles II established a great junta to regulate the competency of the Inquisition. Subsequently the name was extended to assemblies of a strictly legal character. In modern times junta has also become the general name of a committee or administrative board established to accomplish a certain goal, *e.g.*, the junta which organized the opposition against Napoleon's troops on Spanish soil in 1808.

Jupiter (*jū'pĭ-tĕr*), or JOVE, the principal Roman deity, corresponding to the Greek Zeus and to the Sanskrit Dyaus. He was considered to be lord of life and death in the widest and most comprehensive signification, having power over both, in which respect he differs from the Greek Zeus, who was to a certain extent controlled by the sway of the Fates (*q.v.*). Zeus sometimes visited mankind under different disguises, but Jupiter always remained essentially the supreme god



JUPITER

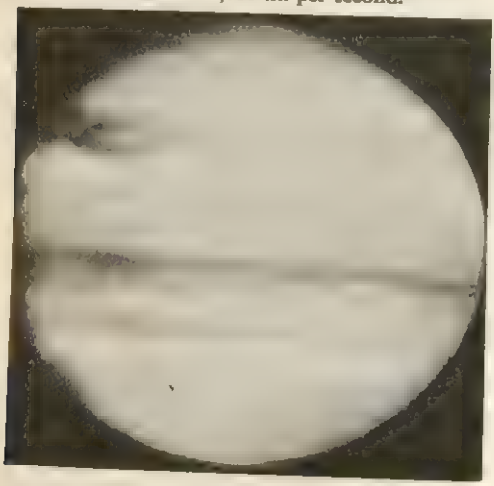
of heaven and never appeared upon earth. In statuary he is represented seated on a throne of ivory, holding a sheaf of thunderbolts in his right hand and a scepter in his left, while an eagle stands behind the throne. The most celebrated temple erected in his honor was that on Capitoline Hill, in Rome, which was built by Tarquin.

Jupiter, the largest planet of the solar system, fifth in order of distance from the sun, being situated in space an average of 478,500,000 m. from that luminary. The mean diameter is about 86,000 m. and the polar diameter is about 82,200. It has a density of about one-fourth that of the earth, but the bulk is nearly 1,250 times greater. It is estimated that the weight is 300 times as great as that of our planet. The orbit of Jupiter is inclined to the ecliptic at the angle of 1° 18′ 40″, and its period of revolution round the sun is 11 years and 10 1/3 months. It is believed that the interior mass is intensely heated, which gives rise to light and dark belts. They are usually parallel to each other, but often merge into one another, and somewhat resemble the spots seen on the sun. When viewed with the naked eye, it is the brightest planet, next to Venus. In 1610 Galileo discovered four of the satellites, or moons, of Jupiter. The principal characteristics of each are as follows:

SATELLITES OF JUPITER

NAME	Mean Distance From Jupiter	Diameter, Miles	Density: Water As 1	Sidereal Period		
				D.	H.	M.
I. Io	267,380	2,352	114	1	18	28
II. Europa	425,156	2,099	171	3	13	4
III. Ganymede	678,393	3,436	396	7	3	43
IV. Callisto	1,192,823	2,929	222	19	16	32

To the above list must be added five others, including one discovered by E.E. Barnard in 1892, another by C.D. Perrine in 1904, and still another by the same astronomer in 1905. However, these are small and comparatively insignificant. The satellites of Jupiter, like that of our planet, revolve once upon their axis while making one complete revolution round the planet. They are eclipsed in the shadow of Jupiter and also by their own shadows, and appear to move in lines nearly parallel from one side of the planet, thus evidently having orbits similar to the orbit of Jupiter, but within the plane of the ecliptic of that planet. In 1706 the Danish astronomer, Olaus Römer (1644-1710), carefully observed the eclipses of Jupiter's satellites and discovered the progressive movement of light. Before his time light was considered instantaneous, but he became convinced that it requires 16½ minutes to travel the orbit of the earth, which has since been verified by the phenomena of the aberration of light, and the velocity has been fixed at 186,000 m. per second.



JUPITER *Courtesy Lick Observatory*

Banded structure is the result of atmospheric conditions

Jura (*jū'rȧ*), a range of mountains in Europe, chiefly in France, Germany. and Switzerland. These highlands trend from northeast to southwest and form the principal boundary between France and Switzerland. In Germany the range is called the German or Franconian Jura. From it derived the name of Jurassic limestone which constitutes the principal geological, formation though this is alternated with sands belonging to the lower Cretaceous series. Several gorges cross the mountain range, and it is otherwise characterized by stalactite caves in which the bones of extinct animals are numerous. The Ain and Doubs Rivers rise in the western slopes and form tributaries of the Rhone. Among the highest peaks are Crêt de la Neige, elevation 5,650 ft.; Reculet, 5,648 ft., and Mont Tendre, 5,520 ft.

Jurassic (*jū-răs'sĭk*), a system of rocks, so named from the Jura Mts. in Switzerland, found above the Triassic and below the Cretaceous systems. Rocks of this system occur in all the continents, but they do not correspond in all cases with the system of Europe. In general they are assigned to the Mesozoic Era, and in most instances are associated with the formations designated as the Lias and the Oölite. They cover large areas of France and Germany, where they contain several thousand species of fossils, and are traceable in Colorado, California, British Columbia, and other sections of North America. The reptiles are very prominent among the fossils, especially the lizards and the Pterosauria, a class of flying reptiles.

Jurua (*zhōō-rōō-ä'*), a river of Brazil, rises in the Andes of Western Peru, flows toward the northeast, and joins the Amazon some distance above Fonteboa. Its entire length is 1,100 m., of which about 560 m. are navigable. The valley of the Jurua is timbered heavily and yields large quantities of rubber.

Jury (*jū'rȳ*), a body of men selected under legal provisions, impaneled, and sworn to investigate questions of fact, and to return a true verdict or decision according to evidence legally placed before them. Two kinds of juries are maintained in connection with courts of justice, grand juries and petit, or common, juries. *Grand juries* generally consist of less than 24 men and more than 11, who are summoned by the county, or parish, sheriff and duly impaneled for service, though in some states the jurors to serve are limited to five or seven, these being selected by lot from the whole number summoned, and those remaining are excused. After administering the necessary oath, the presiding judge instructs them in their duty, when they repair to a closed room and select a *foreman* from their number. Their duties include the consideration of various accusations brought before them by the county attorney, or others, and if they agree by unanimous vote that certain charges against individuals are based upon fact and are of indictable character, they return a *true bill* or *indictment,* which forms the basis of subsequent prosecution in the court of record, otherwise the accusations are dismissed for want of sufficient foundation. Grand juries hear

only one side of criminal procedures. They are relics of the Star Chamber abolished by the Magna Charta, a document which was exacted by the people of England from King John in 1215. They have been abolished in a number of the states. A *blue ribbon jury* or *panel* is also often called to hear important cases, such as criminal procedures. In this type of jury, the jurors are selected for their intelligence, special training, and education.

Petit juries in most instances consist of 12 men, unless a smaller number is agreed upon by the parties to a cause. A petit jury is summoned to serve both in civil and in criminal cases. The decision of a trial jury, known as the *verdict*, is reached by a unanimous agreement. In the lower courts and in some special cases, juries consist of a smaller number of men, usually six. The panel for juries in courts of record includes generally 24 men, of which 12 are selected by parol, though a number of those chosen in this way may be excused peremptorily, or all may be challenged for cause. After the trial jurors have been finally chosen, they are sworn by the clerk or the judge. They hear the evidence in the cause, listen to the plea of the attorneys, are instructed by the judge in relation to points of law, and retire for the purpose of agreeing upon a verdict.

After an agreement has been reached, the jury reports by a written and sealed verdict to the judge at the session of court immediately following an agreement, and before being discharged from service. However, if they cannot reach an agreement, they are discharged from service and a new jury may be impaneled to try the same cause at the same or a subsequent session of the court, though causes of a criminal nature cannot be taken up for trial a second time in case the accused is found *not guilty*. In cases of death by accident or violence, a *coroner's jury* is summoned for the purpose of determining the cause from which death resulted. It is under the direction of the county coroner, or an officer corresponding to a justice of the peace. The inquest may be held at the place where death occurred and in the presence of the body, and, in some cases, a corpse may be exhumed for that purpose. The person or persons who are designated by a coroner's jury as being guilty of a crime are subject to indictment by the grand jury, and triable by the petit jury. However, in many instances, as in a case of death by accident or from an unknown cause, it is impossible to determine who is responsible when no one is accused.

Jus Primae Noctis (*jŭs prī'mē nŏk'tĭs*), in feudal law, the right of the land owner to spend the nuptial night with the bride of each of his serfs. The existence of such a law is disputed by some historians, but it is generally acknowledged that this was the custom in France, Scotland, Ireland, and perhaps in Germany and Italy. It is believed that the custom was replaced by a ransom called *jus cunni*, paid by the bridegroom to the land owner.

Jusserand (*zhüs-rän'*), JEAN ADRIEN ANTOINE JULES, diplomat and writer, born in Lyons, France, Feb. 18, 1855; died July 18, 1932. Jusserand entered upon a long and distinguished diplomatic career at the age of 21; his most important post was that of French Ambassador to the U.S. (1902-25). He was honored by membership in many French, American, and British societies and was noted as an authority on British literature and history. Among his many books are: "Le Roman au Temps de Shakespeare" (1887), "Histoire Littéraire du Peuple Anglais" three volumes (1895-1909), and "The School for Ambassadors, and Other Essays" (1924).

Jussieu (*zhü-syû'*), BERNARD. See *Botany*.

Justice (*jŭs'tĭs*), DEPARTMENT OF. See *United States, Departments of*.

Justice of the Peace, a subordinate official in Great Britain and the U.S., elected or appointed to exercise certain subordinate administrative functions within the limit of a town, borough, or county. In most states of this country, such an officer is elected by the people, while he is appointed in others. He has jurisdiction in minor civil and criminal cases. He may act as coroner and solemnize marriages in some of the states. In most instances he has the power to hold a preliminary examination of those who are charged with grave offenses, and he may either dismiss or bind them over to appear for trial in the upper courts. The duties of the justice are practically uniform in most divisions of Great Britain, but in England this officer is appointed by the lord chancellor, and the judicial functions are supplemented by certain executive duties.

Justification (*jŭs-tĭ-fĭ-kā'shŏn*), a theological term signifying one of the basic concepts of Christianity, namely, God's acceptance of men as righteous "not for anything wrought in them, but for Christ's sake alone" according to the definition of the Westminster Confession (*q.v.*). Roman Catholics define the idea of justification in the article set forth by the Council of Trent (1545-63). "Justification is not remission of sins merely, but also the sanctification and renewal of the inward man through voluntary reception of the grace and of the gifts, whereby man from unjust becomes just."

The idea of justification was introduced into Christian thought by Paul, who states, in contrast to the Jewish concept, that it is not the fulfillment of the law, but the ethical behavior, which makes man just and righteous. Man needs the grace of God, the divine favor bestowed on sinful man, as promised in the appearance of Jesus Christ. It is only by faith that man can be justified, and,

through Christ, even a sinner may be justified, since God helps him to do what would be beyond his own power. No moral accomplishment, no fulfillment of religious commandments can help man in this respect.

In the early centuries of Christianity, justification through the act of God was soon identified with Baptism. In order to gain justification, Christians were supposed to do good deeds, as a kind of compensation for the sins they had committed. See *Penance; Repentance*. The latter idea had been taken over from Roman law into Christian religion by Tertullian (*q.v.*). Paul's teaching on justification, in contrast to Tertullian's more juridical concept, was again emphasized by St. Augustine, who stressed grace as the only source of justification and remedy for man's moral inability. In later periods, the Roman Catholic Church wavered continuously between the Tertullian and the Augustinian concepts of justification and developed a complex set of doctrines to reconcile these seemingly contradictory axioms. It was Thomas Aquinas (*q.v.*) who finally established the freedom of the will (and hence the capacity of man to perform good deeds), within the limits of divine grace in the sense of Paul. This distinction between the realm of grace and the realm of free will was maintained through the Middle Ages by the Scholastics.

Martin Luther interpreted Paul's doctrine of justification as God's relationship toward the sinner by grace, as revealed in Christ. Man can be justified and reborn only by faith, exactly as Paul taught, but at the same time he is justified through the assurance of divine forgiveness in the New Testament. Thus, in a certain way, Christ's righteousness is transferred to each Christian, and Adam's sin is balanced. In Protestantism today, there are still two tendencies, the one emphasizing justification through experience of God in Christ, the other considering justification as coming entirely from outside through the divine will. See *Christianity; Atonement; Grace; Original Sin*.

Justinian I (*jŭs-tĭn'ĭ-ăn*), surnamed *The Great*, Emperor of Byzantium, born in the village of Tauresium, Illyria, about 483 A.D.; died Nov. 14, 565. He was the nephew of Emperor Justin, was born a slave, secured a good education at Constantinople, and received a share in the prosperity of his uncle. In 521 he was chosen consul. He was made coemperor in the government with Justin in 527, and at the death of the latter was proclaimed emperor. Owing to a wise selection of generals, his reign of 38 years became the most successful in the later history of the Roman people. The generals chosen by him included Belisarius, who in 523 and 529 defeated the Persians and attained victories in Africa. Narses, another of his commanders, overthrew

Courtesy Greek Govt. Office of Information

JUSTINIAN I

From a Byzantine mosaic in Ravenna, Italy

the Ostrogoths' supremacy, thereby widening the Roman dominions to about the same extent as the limits during the time of its higher prosperity. Besides being a wise ruler, Justinian ranks as a great lawgiver. He commissioned to learned civilians to codify the imperial statutes. These, however, did not contain all the laws, since the greater part of the Roman law was included in the writings of commentators and jurists. Under the direction of Tribonian a commission prepared a single treatise that embodied all the common law, which was published after four years of labor as the "Digest." It was published in a complete form in 50 volumes. Tribonian also published a treatise on law which served as a textbook for students and is known as "Justinian's Institutes." Likewise, Justinian's attention was turned to the building of cities, fortresses, and churches. He rebuilt the celebrated Church of St. Sophia at Constantinople. His intentions were both just and upright, but the extensive movements favorable to progress and improvement greatly burdened the people with taxes, and his successors were not capable of carrying forward the vast enterprises for which his reign is noted.

Justitia (*jŭs-tĭsh'ĭ-ä*), a goddess of the ancient Romans, symbolizing justice. She is generally represented as blindfolded, holding a scale, thus signifying an unprejudiced opinion.

Jute (*jōōt*), the fiber of two plants, *Corchorus capsularis* and *C. olitorius*, in the linden family, cultivated in India and Pakistan.

Jute cultivation has been introduced elsewhere—in 1870 it was started in the U.S.—but the commercially important quantities still come from the Indian subcontinent. The jute plants grow from 5 ft. to 15 ft. high, producing, near the top of the cylindrical stalk, light-green leaves with serrated edges. The fiber is produced beneath the bark, and the plant must be treated more or less as flax (*q.v.*) is treated to extract it. Jute is used chiefly in the manufacture of burlap, ropes, cordage, rug and carpet backing, and matting. As a textile, it is inferior to cotton and linen fabrics, but the best grades have silky texture, high luster, and take dyes easily. Jute cuttings are also used in papermaking. The U.S. imports of jute and jute manufactures for domestic consumption were valued at $112,000,000 in 1957. The world production of jute totaled more than 20,760,000 tons in 1956.

Jutes (*jōōts*), the name of a tribe who resided in the lowlands of Germany at the beginning of the Christian era. With the Angles and Saxons they invaded and colonized England in the 5th century A.D. See also *Anglo-Saxons.*

Jutland (*jŭt'lănd*), in Danish JYLLAND, a peninsula of Europe which forms the Danish mainland. When the term is used geographically it includes the German region of Schleswig-Holstein. The political area, the Danish mainland and the islands of Lim Fjord, covers an area of 11,411 sq. m. Population, *ca.* 1,825,000.

Juvenal (*jōō'vē-năl*), in full, DECIMUS JUNIUS JUVENALIS, Roman satirical poet, born *ca.* A.D. 60, died *ca.* 140. Knowledge about the life of Juvenal is very limited, and myth has been confused with fact in many biographies. Although statements have come down to us from medieval manuscripts, which published facts of his life with his work, interpretations by scholars have been too contradictory to carry much authority. What is known of him is what is in his poetry.

There are 16 satires of Juvenal in existence. These satires are scathing denunciations of the life of the Romans during his time, and in particular during the rule of Domitian, although what he criticizes is not entirely alien to contemporary society. The poems satirize the invasion of Rome by foreigners, poor housing, high rents and the high price of food, traffic noises, and crime. He denounces the Roman senate, the indignities suffered by men of respectable ancestry, and the lack of support for literary men and other men of learning. He derides those who pride themselves on their birth rather than their virtue. He criticizes parents for being bad examples to their children. The tenth of the satires, known as "The Vanity of Human Wishes," is the best known and was imitated by Samuel Johnson. The satires have been translated by Dryden, Gifford, and C. Badham.

Juvenal contributed to the development of the satire by lifting it from comic buffoonery to a serious art.

Juvenile Delinquency (*jū'vē-nīl dē-lĭng'-kwĕn-sĭ*), transgressions of the law by persons under age (*q.v.*). It is of concern as a threat to the well-being of the nation's children and youth. It is a perennial anxiety of the adults of each generation—the belief that its younger generation misbehaves more than any previous one. The volume and seriousness of misbehavior in different eras is difficult to compare, however, because standards of conduct and methods of handling delinquency and recording its incidence differ.

Newspaper and magazine reports have emphasized the fact that juvenile delinquency has increased during the past decade. It is not possible to determine the precise extent of the increase because of the extreme difficulties in measuring juvenile delinquency. General observations, however, may be made from the statistics available. The most comprehensive figures on the subject are those reported yearly (since 1927) to the U.S. Children's Bureau (*q.v.*) by a varying number of juvenile courts. Such data indicate that after 1940 there was a general upward trend during the period of World War II, to a peak in 1945, and a downward trend for three years after the war. Beginning in 1949, however, the downward trend was reversed, and the movement continued upward each year through 1957. This rising trend resulted in figures for 1953 that exceeded the peak of World War II and for 1957 that reached the highest levels ever. Police arrests of children as reported by the Federal Bureau of Investigation are another source of delinquency data. Such arrests also show increases in recent years.

The increases have not been limited to large, densely populated urban areas, as is so often believed. On the contrary, the increases seem to be greater in the smaller communities and in rural areas. Even though increases have been somewhat larger in the smaller areas, juvenile delinquency is still primarily an urban problem—most delinquency is concentrated in large cities.

The juvenile court statistics show that, during 1957, about 603,000 delinquency cases were disposed of by all juvenile courts in the U.S. Boys' cases outnumbered girls' in the ratio of about 5 to 1. These estimates are based on data obtained from a representative sample of juvenile courts in the U.S. Data on the ages of the children involved, the offenses committed, and the dispositions of the cases are not available from the sample. However, an analysis of reports from 15 states, whose data include almost half of all the total delinquency cases in the country, reveal that (excluding traffic violations) the greatest concentration was in the 14-to-16-year age group—37 per cent of the boys' cases and 46 per cent of the girls'

cases. For the boys' cases, "stealing" ranked first as the reason for reference, accounting for 48 per cent, and "acts of carelessness or mischief," second, accounting for 14 per cent. Of the girls' cases, 52 per cent were referred for "being ungovernable," "running away," and "sex offenses." Forty-five per cent of all the cases were disposed of by dismissal, adjustment, or being held open without further action; 27 per cent by placing the child under the supervision of a probation officer; and 7 per cent by committing the child—or referring him in unofficial cases—to a public institution for delinquents. Additionally, some children are committed or referred to other agencies or to a private institution for delinquents.

The fact should be remembered constantly that only a small proportion of the children of the nation ever have a court experience. Throughout the past decade, the spectacular misbehavior of some teen-age youths has tended to obscure the fact that most of the younger generation has behaved admirably.

Because juvenile delinquency results from many different causes—perhaps from a breakdown in home life or in community safeguards for youth or from inadequacy of school programs—its prevention and control require many avenues of approach. Community efforts should be based on an intensification of the protective family and community care that all children need. Making these efforts effective requires the action of individual parents, the school, the church, and local social and civic agencies. The role of state and Federal governments is to provide information and advice to local groups and, when necessary and possible, financial assistance.

Most "delinquent" children can be dealt with in their own homes without police or court action if social services are available to help them and their families with their problems. Large U.S. cities have long had children's agencies and child-guidance clinics that help young people who are misbehaving, although never with enough services for all who need them. However, children in rural areas had little such service until the passage of the Social Security Act in 1935 providing for Federal grants to the states to establish, extend, and strengthen, especially in predominantly rural areas, public welfare services for the protection and care of homeless, dependent, and neglected children, and children in danger of becoming delinquent. As yet, only about one-half of the counties of the U.S. have access to a fulltime public child-welfare worker. Their services are planned to raise the standard of child care for all the children in the county and to develop social services to individual children in need of special attention. The goal for the nation as a whole is to have at least one child-welfare worker accessible to each county.

The police and other law-enforcement officials and the juvenile courts represent the authoritative agencies that deal with children who break the law. The police are in a strategic position to discover potential delinquents early, when skillful treatment by family or social agency might prevent serious misbehavior later. It is most important that the police understand the factors that influence youthful behavior and that they know the community's social resources and how to use them for children in trouble. More and more law-enforcement agencies are training some of their officers in this understanding and knowledge.

Juvenile courts grew out of the idea that children in trouble should be helped and not punished. For this purpose, the best courts have probation officers for the supervision of children whose behavior seems, upon study, to be the result of difficulties at home, at school, or at play. For children who need closer supervision and more concentrated treatment, training schools are provided, usually by the state, with the goal of helping young delinquents to fit into life more effectively.

A large number of children coming to the attention of juvenile courts—some of them very young—are detained pending the disposition of their cases. Unfortunately, the conditions under which they are held are sometimes extremely bad. For instance, children may be held in jails unfit for any detention, perhaps in the same cells with adult offenders and sometimes for weeks or months—even though most juvenile-court laws forbid these practices.

A recent hopeful move toward more effective control of delinquency is the establishment of youth commissions and similar planning bodies by different states. They recognize the unity that community forces for good must weave in order to eliminate this persistent danger.

K (*kā*), the 11th letter and eighth consonant of the English alphabet. It has a guttural articulation before all consonants and vowels, except before *n*, where it is silent, as in *knell, knife,* and *knit.* From the 16th to the 18th centuries it was written after *c* at the end of a word for the purpose of strengthening the hard *c,* as in *publick, musick,* and *almanack.* In the French the letter *k* is used only in a few Greek derivatives, and in the Italian, Spanish, and Portuguese it has gone out of use. In German some words are written either with *c* or *k,* as *Carl* or *Karl, Cöln* or *Köln.* As a symbol, in chemistry, *K* stands for potassium (*kalium*). K signifies Knight; K.B., Knight of the Bath; K.G., Knight of the Garter.

Kaaba (*kä'bä*), or CAABA, an oblong stone structure in the great mosque of Mecca. It constitutes the sacred shrine to which Moslems make their pilgrimages for religious worship. According to legend, it is located on the spot where Adam offered his first worship after being expelled from the Garden of Eden. Some writers assert that a tent was sent from heaven in which the worship took place, but others hold that Adam built a structure of stone and clay, which was destroyed by the deluge, but was afterward rebuilt by Abraham and Ishmael. The structure is 45 ft. wide, 55 ft. long, and about 40 ft. high. It occupies a place in the sacred area of the mosque, which is surrounded by a wall and colonnades. The back-stone, or *Keblah,* is at the southeast corner of the Kaaba, where it is held by masonry, and toward it every pious Moslem directs his face when praying. To kiss the Kaaba is the supreme object of every pilgrim.

Kabul (*kä'bul*), or CABUL, the capital of Afghanistan since 1774, when it was made such by Timour (Tamerlane). It is situated in the province of the same name, at the junction of the Loghar and Kabul Rivers, on a productive plain southwest of the Hindu-Kush Mts., at an altitude of 6,375 ft. above the sea. The walls of former times are largely in ruins. Besides a number of government buildings, it contains a Jewish synagogue, several mosques, and the tomb of Sultan Baber. The manufactures consist chiefly of marble products, guns and ammunition, textiles, and machinery. It has an important trade in merchandise, fruits, jewelry and livestock. Many of the bazaars are large and are noted for their trade in fine carpets and rugs. Kabul was captured by the British in 1842 and 1879. Within recent years it has been influenced more or less by the advances of Russia. The inhabitants include Afghans, Hindus, and Jews. Population, *ca.* 127,500.

Kadesh Barnea (*kā'dĕsh bär'nē-ȧ*), a city mentioned in the Scriptures as the place of encampment of the Israelites as they journeyed on their exodus from Egypt. It was the death place of Miriam, sister of Moses, and became celebrated on account of Moses and Aaron offending the Lord by presuming that water would flow from the rock when struck before the people with a rod in their own name, rather than by the help of God. For this sin Moses and Aaron were punished by being forbidden entrance into the promised land. The district of Kadesh is prominent in the accounts written of Abraham, Hagar, and Ishmael.

Kafir Corn (*kä'fĕr kôrn*), a species of sorghum native to South Africa. It has been naturalized in the arid region of the U.S., where it is grown extensively for fodder and for its seed. Large fields of this product are grown in the region extending from western Nebraska to the Gulf of Mexico. It is drilled in rows similar to

sorghum and cultivated in early growing season like corn. The crop is harvested with a corn harvester, after which it is either threshed to separate the seed, or both the stalks and the seed are fed to stock.

Kafiristan (*kä-fē-rēs-tän'*), meaning *the country of infidels,* the name applied to a region of Asia, located southeast of Afghanistan. The area is about 5,000 sq. m. It is situated between the Hindu-Kush Mts. and India. The country is mountainous and is inhabited by the Siaposh, or Kafirs, a native race consisting of tribes that vary greatly in stature and complexion. They engage chiefly in agriculture, fruit growing, and cattle raising. They have become distinguished for their love of independence and their strenuous resistance to the Mohammedan faith. Their dress is mostly of goatskins and fabrics woven from the hair of goats. Some writers consider the Kafirs of Asia an admixture of Greeks and Hindus. The total number of these people is about 200,450.

Kafirs (*kăf'ērz*), or KAFFIRS, an Arabic word meaning *unbelievers,* the common name of the most important native race of Southeastern Africa, a branch of the Bantu family. The region occupied by these people extends with more or less variation from Delagoa Bay to Cape Colony. The head of the Kafir is shaped more like that of Europeans than the head of Negroes. The nose is high, the hair is frizzled, and the complexion is brown, with lighter variations in those found in the southern districts. In their habits they are frugal and simple. The race generally is tall and muscular, and the occupations pursued chiefly are hunting and cattle raising. The women engage to some extent in the cultivation of cereals, vegetables, and fruits. Several distinct branches of Kafirs have been described, including the Swazi, Pondos, Fingoes, and Zulus. The last-named tribe is especially numerous in the British colonies of Natal and Cape Colony, and has shown marked improvement under the influence of missionaries and teachers. As a rule the Kafirs are deficient in sentiments of religion. They are exceptionally superstitious and generally believe in witchcraft.

The first accounts of the Kafirs were published in 1617, when they came in contact with the Dutch colonists, who began to make settlements near the Cape of Good Hope. After 1688 they are mentioned frequently in the colonial records kept by the Dutch. After settling in Cape Colony, the British began to press them and claim their lands, which resulted in several wars, notably those in 1811-12, and at numerous times since. The War of 1846 led to the reservation of a district known as Kaffraria. Originally they occupied territory which comprised 1,000,000 sq. m., but with the general occupation of Africa by European powers they have been largely localized and their habits of living have been greatly modified. The total number at present is about 1,000,000. See *Zulus.*

Kafka (*kăf'kä*), FRANZ, author, born July 3, 1883, in Prague, Czechoslovakia; died in 1924 in Klosterneuburg, Austria. He was educated as a lawyer in Prague, but never practiced. For a time he worked for an insurance company and then for the government, but his health, which was always poor, became worse after World War I and forced him to stop work. He traveled from sanitarium to sanitarium, finally dying in one. His writings were rather numerous, but he destroyed most of them. He even requested in his will that his unpublished work be destroyed, a request with which his literary executor fortunately refused to comply. Among his books, most of which are incomplete, are: "Observations," "The Castle," "The Great Wall of China," "The Metamorphosis," "The Trial," and "America."

His characters are innately in a peculiar state of suspension, often growing into catastrophic tension. They are consciously and continuously aware of a menacing danger, of a threat to themselves, of something terrible which may happen to them. Thus, their actions are no longer ruled by reason or by facts of reality, but by their consciousness of past or expected events. The reader, however, is never sure how many of these events have been or will be real, and how many have been imagined by the character. At the same time, Kafka's form of narration plays continuously with a "stream of consciousness" technique, which since then has become so popular among modern writers, especially James Joyce (*q.v.*).

Kafka's influence helped to create that school of English language writing which represents the opposite of the naturalistic school, from F. Scott Fitzgerald to Hemingway.

FRANZ KAFKA

Courtesy Press Association, N. Y.

Kagoshima (*kä-gō-shē-mä*), a city in Japan at the southern end of Kyushu Island, on the west side of Kagoshima Bay, 600 m. s.w. of Tokyo. It is a major seaport and ships lumber, dried fish, and silk. The well known Satsuma porcelain ware is manufactured here, as well as silk and cotton clothing and tinware. The city is a naval base and was heavily bombed in World War II. Population, 1960, 295,964.

Kahn (*kän*), ALBERT, architect, born in Westphalia, Germany, March 21, 1869; died in Detroit, Mich., Dec. 8, 1942. He came to the U.S. in 1881 and, after studying abroad (1890-91), became an architect in Detroit (1904). An authority on concrete construction, he was one of the first to design modern factory buildings, including several automobile plants. His firm designed more than 2,000 industrial buildings, both in the U.S. and abroad.

Kahn, ELY JACQUES, architect and designer, born in New York, N.Y., June 1, 1884. After being graduated from Columbia Univ. (1907), he studied in France and worked in various architects' office in Paris and New York before entering the firm of Buchman & Kahn (1917). Twelve years later he established his own office and in the same year joined the staff of the Metropolitan Museum Committee for Decorative Art Exhibitions. After serving as chief of the industrial arts section for the Chicago Centennial Fair of 1933, he was given a $10,000 grant by the Carnegie Corp. to make an international survey of industrial art. He traveled around the world, and the results of his study were published under the title "Design in Art and Industry" (1937). Kahn was then for a time an adviser to the U.S. Housing Authority.

Kahn, OTTO HERMANN, banker and opera patron, born in Mannheim, Germany, Feb. 21, 1867; died in New York, N.Y., March 29, 1934. He learned banking in Germany and worked for five years with the London branch of the Deutsche Bank before coming to the U.S. in 1893. He entered the banking firm of Speyer & Co. and four years later became a partner in the banking house of Kuhn, Loeb & Co. He served as director or trustee for many railroad and trust companies and accumulated a large fortune. Interested in music and musical organizations, he was president and chairman of the board (1918-31) of the Metropolitan Opera Company and vice president of the Philharmonic Symphony Orchestra Society in New York City.

Kahoolawe (*kä-hō-ō-lä'vä*), an island of Hawaii (*q.v.*).

Kailas (*kī-läs'*), a peak in the Kailas Range of the Himalaya Mts., in southwest Tibet. It is 22,028 ft. high and is a Hindu pilgrimage center because it is said to be the site of the paradise of Sita and Parvati, Hindu goddesses.

Kairouan (*kīr-wän'*; in French, *kēr-wän'*) or KAIRWAN, Arabic QAIRWAN, a city in northeastern Tunisia, *ca.* 80 m. s. of Tunis. Noted for its carpets and leather goods, it has trade in cereals, olives, sheep, wool, and skins. It was founded in 671 by the Arab conqueror Sidi Okba and is a holy city of the Moslems, with many magnificent mosques. Population, 1956, 39,968.

Kaiser (*kī'zĕr*), a word derived from the Latin term caesar (*q.v.*) and used as the official title of the head of an ancient or medieval empire, such as that founded in 800 by Charlemagne (*q.v.*) and re-established in 962 by Otho I (*q.v.*). Kaiser was the title of the emperor of Austria from 1804 to 1918. When William I of Prussia was proclaimed emperor of Germany at the conclusion of the Franco-Prussian War (1871), the ancient title of the German emperor was revived and used until 1918.

Kaiser, GEORG, dramatist, born in Magdeburg, Germany, in 1878; died in Ascona, Switzerland, June 5, 1945. He worked in business (1899-1902) in Buenos Aires, Argentina, before beginning to write (*ca.* 1902). His plays were, for the most part, satirical, and his later work was usually on social themes. He became a leader of the expressionist school of drama, and his work had a great influence on the European and American theater between the two world wars. When the Nazis came to power, he fled to Switzerland. His plays include *"Die Jüdische Witwe"* (1911), *"Die Bürger von Calais"* (1914), "From Morn to Midnight" (1916), and a trilogy: "The Corals" (1917), "Gas I" (1918), and "Gas II" (1920).

Kaiser, HENRY J., industrialist, born in Sprout Brook, N.Y., May 9, 1882. After constructing highways in British Columbia, Washington, California, and Cuba (1914-30), Mississippi levees (1927-30), and pipeline projects in the Southwest (1930-33), he became chairman (1931) of the executive committee of Six Companies, Inc., in charge of constructing Boulder Dam (*q.v.*), now Hoover Dam. He was president of the group of companies that built Grand Coulee Dam and other major construction projects. Interested in shipbuilding, he established his own shipyards in California and Oregon (1940); utilizing improved methods of prefabrication and assembly, he built ships, including 50 18,000-ton aircraft carriers, in record time. In World War II, he entered the aviation and munitions industries. After the war his business interests continued to expand, and by 1960 the Kaiser Industries Corp., of which he was chairman, comprised 32 corporations and more than 50 affiliated companies and subsidiaries, including factories, mines, construction firms, and engineering and real estate projects.

Kaiser's son, Edgar F., is a company officer, as was another son, the late Henry J., Jr. (1916-1961).

Kaiser Wilhelm Canal. See *Kiel Canal.*

Kaiserslautern (*kī-zĕrs-lou'tĕrn*), a city of Germany, in the Bavarian Palatinate, 40 m. w. of Mannheim. It has railway facilities, an industrial museum, and a number of churches. The manufactures include furniture, cotton and woolen goods, boots and shoes, machinery, and ironware. The city contains the ruins of a palace built by Frederick Barbarossa in the 12th century. In 1801 the city was made a part of France, but in 1816 became a possession of Bavaria. Following World War II, it was placed under French occupation. Population, *ca.* 55,000.

Kakemono (*kä'kē-mō-nō*), term used for a Japanese picture, either painted on fabric or embroidered on silk. Unlike European paintings, the kakemono can be rolled up.

Kalahari (*kä-lä-hä'rē*), a vast desert in South Africa, located N. of the Orange River and immediately E. of Southwest Africa. The extent from east to west is 400 m. and from north to south, 600 m. Much of the surface is level, having an elevation of 3,500 ft., and vegetation thrives in various parts of the interior. Rains fall copiously from August to April, but the rivers and most of the lagoons dry up during the season of drought. Bushmen and Bakalahari are the principal inhabitants. The giraffe, lion, leopard, antelope, and other wild animals are met with. Melons, grasses, shrubs, and thorny trees are the main plants.

Kalamazoo (*kăl-ə-mə-zōō'*), a river in Michigan. The Kalamazoo rises in the Lower Peninsula, in Hillsdale County, and flows generally west and north for 200 m., emptying into Lake Michigan about halfway between Grand Haven and South Haven. It is navigable for some 50 m. The river was important to the development of the region, in the early period as a trade route and later as a source of power. Kalamazoo and Battle Creek are the largest of the cities on the Kalamazoo.

Kalamazoo, a city in Michigan, seat of Kalamazoo County, on the Kalamazoo River, 25 m. w. of Battle Creek. It is served by the New York Central, the Pennsylvania, and other railroads. Primarily an industrial community, Kalamazoo produces paper, pharmaceuticals, and transportation equipment. Fruits, grains, and livestock are raised in the vicinity. Western Michigan Univ. and Kalamazoo Coll. are located here. A trading post named Kalamazoo was set up here in 1823 and a permanent settlement named Bronson in 1829. Returning to its original name in 1836, Kalamazoo was incorporated as a village in 1843 and chartered as a city in 1884. Population, 1950, 57,704.

Kalb (*kälp*), JOHN, BARON DE. See *De Kalb, John.*

Kaleidoscope (*kə-lī'dō-skōp*), an optical instrument which produces a wide variety of symmetrical colored designs, invented in 1817 by David Brewster. Its usual form is a cylinder containing two plane mirrors. The mirrors face each other, at any angle of which 360° is a multiple; the best angle is 30°. The inside diameter of the tube should be such as to permit the mirrors to fit snugly at their adjusted angle. One end of the tube is closed by a cover pierced by a small eyehole. The opposite end is closed by two round disks a slight distance from each other. The inner disk—that nearest the eyehole—is of clear glass or plastic. A narrow separator ring creates the space between the clear inner disk and the outer disk, which latter is of frosted glass (or plastic). Between the clear disk and the frosted one, before the frosted disk is sealed into place, are inserted small pieces of colored glass, beads, pebbles, or seashells—any small objects which will fall around freely between the two disks. When the tube is held to the eye, with the glass-disk end pointed toward a light, and revolved or shaken, the loose objects form a succession of intricately changing patterns. It has been a favorite children's toy ever since its invention, but is also used by designers to obtain patterns for textiles, jewelry, and other decorations.

Kalevala (*kä'lä-vä-lä*), the national epic of Finland. The poem is composed of ancient songs of the region, dating from the Middle Ages, about mythological heroes. The present form of the poem, a collected whole, was arranged by Elias Lönnrot (1802-84), who published it in 1835 after years of collecting the material. Later research resulted in the addition of more verses.

Kali (*kä'lē*), the name of a Hindu goddess, formerly worshiped with sacrifices of human beings. She is one of the forms of the wife of Siva, and is the goddess of cholera and other epidemics. In statuary she is represented standing on the body of her husband, wearing a necklace of skulls and a belt of serpents. At Calcutta is a famous shrine of Kali, where goats and other animals are offered as blood sacrifices on her altars. See also *Siva.*

Kalidasa (*kä-lē-dä'sä*), poet, lived in India in the 5th century A.D. Little is known of the life of this Hindu poet and dramatist, often called "the Shakespeare of India." He was a member of a literary group called "The Nine Gems" which flourished under the Gupta dynasty. He wrote two long epic poems, lyric poetry, and three great dramas, the best-known of which is his "Sakuntala," first translated from the Sanskrit into English by Sir William Jones under the title "The Lost Ring" (1789). His work is now available in several modern translations.

Kalilah and Dimna (*kăl'ĭl-ä and dĭm'nä*), a famous collection of East Indian fables first written in Sanskrit. Bidpai (Sanskrit meaning "wise man") is given as the author. Name and

original date are entirely hypothetical. In the 6th century A.D. part of the collection was translated into Pahlavi and into Syriac idiom. Two centuries later it was translated into Arabic from the Pahlavi translation. This last version is the best known, the great French fable writer La Fontaine (*q.v.*) taking from it inspiration for many of his fables.

Kalinin (*kă-lē'nēn*), formerly Tver, principal town of the Russian province of Kalinin (Tver), situated on both banks of the Volga River, at its junction with the Tvertsa. A dam protects the low right bank from being flooded, and the location of Kalinin on the navigable river as well as on the Moscow-Leningrad Ry. makes it an important trading center. Its manufactures include textiles, machinery and leather goods. Its history dates back to the 12th century at which time it was a fort. Later the capital of an independent principality, it was almost completely burned by the Muscovites, and annexed by Moscow in 1490. In 1570, Tver was subjected to a massacre under the reign of Ivan the Terrible. Pop., 1939, 216,000.

Kalinin, MIKHAIL IVANOVICH, statesman, born in Tver district, Russia, 1875, of peasant parentage; died in 1946. Village schooling, apprenticeship in a munitions factory, and metallurgical factory work in St. Petersburg at the age of 16, preceded his political career. Early active in Marxist circles, he joined the Social Democratic Labor Party in 1898. He was arrested for the first time in 1899, and, forced to leave St. Petersburg, continued his revolutionary work at Tiflis in the Caucasus, and at Revel (now Talinn) in Estonia. Returning to St. Petersburg in 1905, he participated in the revolution of that year, and, in 1908, moved to Moscow, where he directed the party underground press organization. He was elected to the central committee of the Communist Party in 1912, and subsequently held several party offices. During the Revolution of February 1917, he organized the proletariat of Petrograd, and after the October Revolution, headed the Petrograd city duma. Active during the civil war, he was in charge of the commission for famine relief (1919-22) and later was awarded the Order of Lenin for service to the state. His political achievements culminated with his election to the presidency of the Supreme Soviet of the U.S.S.R. (1938). He retired from office due to ill health (March 1946), being succeeded by Nikolai Shvernik.

Kalispel (*kăl'ĭ-spĕl*), or PEND D'OREILLE, a tribe of Indians in the U.S., found chiefly in Idaho and Washington. They are federated with the Flatheads and Kootenai Indians on the Flathead reservation.

Kalispell (*kăl'ĭ-spĕl*), county seat of Flathead County, Montana, 155 m. N.W. of Helena, on the Stillwater River and on the Great Northern Ry. Kalispell trades largely in farm produce and machinery. It was settled in 1891 and incorporated in 1892. Population, 1940, 8,245; 1950, 9,737.

Kalmar (*kăl'mär*), a seaport of Sweden's Baltic coast, capital of Kalmar district, situated 250 m. S.S.W. of Stockholm on an island in Kalmar Sound. Limestone from nearby Oland island is used in its principal buildings, including the 17th-century cathedral. The island fortress of Kalmarnahus, dating from the 12th century, contains the noteworthy chamber of King Eric XIV. In 1397, the Union of Kalmar took place here when Norway, Denmark, and Sweden were formed into one kingdom. Matches, tobacco, and paper are produced. Population, *ca.* 25,000.

Kalmia (*kăl'mĭ-ȧ*), a genus of shrubs native to North America, consisting mostly of evergreen species. The common kalmia attains a height of 3 ft. and bears corymbs of beautiful flowers. To this class of plants belongs the *mountain laurel,* which is native to the Allegheny Mts., where it grows to the height of 30 ft.

Kalmucks (*kăl'mŭks*), or CALMUCKS, a people of the Mongolian race. In character they are warlike and nomadic and engage largely in agriculture and stock raising. The Kalmucks are native to the Chinese Empire and certain districts of Siberia and European Russia, extending westward as far as the Volga. They are colonized in large settlements on the Volga, Ural, and Don Rivers. In stature they are of middle height, possess considerable strength, and are marked by prominent cheek bones, a short chin, a thin beard, and very shaggy hair. Their religion is Lamaism. The language is allied closely to the Mongolian proper, and is written with a similar alphabet and grammatical construction. The total number includes about 700,000, of which one-half reside in China, about 125,000 in Russia, and the remainder in Central Asia. They have conducted numerous wars against the Tartars, Chinese, and Russians. Those in Europe have been converted largely to the Greek Church by Russian missionaries.

Kama (*kä'mȧ*), a river of Russia, the largest branch of the Volga. Its source is in the province of Vyatka. It makes a bold turn through Perm and flows into the Volga in the province of Kazan, about 40 m. below the city of Kazan. The Kama forms a part of the principal highway of commerce for boats between Leningrad and Siberia, is free from ice about eight months of the year, and has been improved by several canals. The total length is 1,300 m. It is navigable about 850 m. A canal connects it with the Dvinsk, thus uniting the White and Caspian Seas.

Kama, or KAMADEVA, the god of love among the Hindus, corresponding to Cupid of the Romans and Eros of the Greeks. He was the son of Brahma and lost his life while trying to tempt Siva, but was born again as the son of Krishna.

After his second birth he was called Pradyumna, another name for Cupid. In statuary he is represented with a bow made of sugar cane, which is strung with a line formed of bees, and he bears five arrows ornamented with the blossoms of flowers. With these arrows he is able to overcome the five senses.

Kamchatka (*kăm-chăt'kä*), or KAMTCHATKA, a province of the Far Eastern Region of Soviet Russia composed of a peninsula which extends from northeast to southwest in northeastern Asia. It is bounded on the N. by the Arctic Ocean, on the E. by the Bering Sea, S. by the Pacific, and W. by the Sea of Okhotsk. The area is 69,711 sq. m. A volcanic mountain range runs through the center of Kamchatka Peninsula. The climate is cold, though vegetation during the warmer parts of the year is remarkably luxuriant. The Kamchatka is the most important river, having a length of 110 m., and flows northward through the most fertile and populous portion of the peninsula. Among the minerals are iron, copper, mica, lignite, and sulfur, which are mined largely under Russian supervision, but the principal products include furs and fish. Many fur-bearing animals are native to the region, including the beaver, bear, sable, and Arctic fox. Farming and herding are being developed. The inhabitants consist chiefly of Kamtschadales, Koryaks, and Russians. Since 1706 it has been a possession of Russia. Petropavlovsk is the chief town. The total population of the peninsula is *ca.* 8,500.

Kamehameha (*kä-mē-hä'mē-hä*), the name of five kings of the Hawaiian Islands, who ruled successively from 1811 to 1872, excepting only the period between 1824 until 1833, when the government was under the regency of two queens of Kamehameha II.—*Kamehameha I*, the first of these rulers, was aided by several European vessels in subjugating the whole group, which was effected in 1809. He introduced a number of civil arts by employing European mechanics.—*Kamehameha II* was the son of the preceding king. He abolished idol worship on ascending the throne, in 1819, and secured the service of missionaries from Boston to teach his people the rudiments of reading and arithmetic. In 1824 he and his queen visited London, where both died of measles.—*Kamehameha III*, brother of the preceding, ascended the throne when 19 years of age, in 1833. Educated by American missionaries, he granted the people a written constitution and a code of laws in 1848, and exercised considerable influence for education and civilization.

The independence of the Hawaiian Islands was recognized by the U.S. in 1842 and by France and England a year later. On Dec. 15, 1854, the king died childless in Honolulu, aged 40.—*Kamehameha IV*, nephew of the preceding, was born in Hawaii, Feb. 9, 1834; died Nov. 30, 1863. His education was obtained from American missionaries. After visiting in the U.S., England, and France, he succeeded to the throne in 1854.—*Kamehameha V*, eldest brother of the preceding, was born Dec. 11, 1830; died Dec. 11, 1872. He held the position of minister of the interior and commander-in-chief of the army during his brother's reign, and succeeded to the throne in 1863. He opposed the constitution, thinking it too democratic for the common weal, and called a convention to form a new one, but dissolved it himself, and prepared a constitution less democratic than the one formerly in force. Though fearless, strong-minded, and firm, he was suspicious of the people and avaricious in his government. He left no heir to the throne, and the dynasty ended with his reign.

Kamerlingh-Onnes (*kä'mēr-lĭng-ôn'ĕs*), HEIKE, physicist, born in Groningen, Holland, Sept. 21, 1853; died Feb. 21, 1926. From 1882 until his death he taught at the Univ. of Leyden, his research centering in the field of the kinetic theory of matter. Working in his own laboratory, he conducted experiments on physical properties at low temperatures and succeeded in liquefying hydrogen and helium. Most important of his discoveries was the super-conductivity of certain metals—the loss of electrical resistance at very low temperatures. As a result of his discoveries, Kamerlingh-Onnes was awarded the 1913 Nobel Prize for physics.

Kamet (*kŭ'măt*), a 25,447-ft. peak in the Himalaya, India, on the border of Tibet. It was first scaled by a British expedition in June 1931, at that time the highest altitude ever reached by man.

Kanaka (*kä-nă'kä*), the name applied by white traders and sailors to a native of the Hawaiian Islands. Later the term came into use to designate the natives of New Caledonia, the New Hebrides, and other oceanic islands. The term kanakas is now used in the sense of the name *coolies*, when speaking of the native laborers of Hawaii.

Kanazawa (*kä'nä-zä'wä*), a city of Japan, situated near the northeastern coast of the island of Hondo. It contains numerous public institutions, several famous temples, and ruins of old fortifications. The manufactures include porcelain, silk, toys, and paper. It has railroad connections, waterworks, several parks, and a large trade. Population, *ca.* 130,000.

Kandahar (*kăn'dä-här*), a city in Afghanistan, capital of the province of Kandahar (area, *ca.* 50,000 sq. m.; pop., 1,064,000), *ca.* 300 m. S.W. of Kabul. It is the second-largest city in Afghanistan and a leading commercial center. Since the country has few transportation facilities, Kandahar's road link with Chaman, in Pakistan, has made it a vital outlet for external trade.

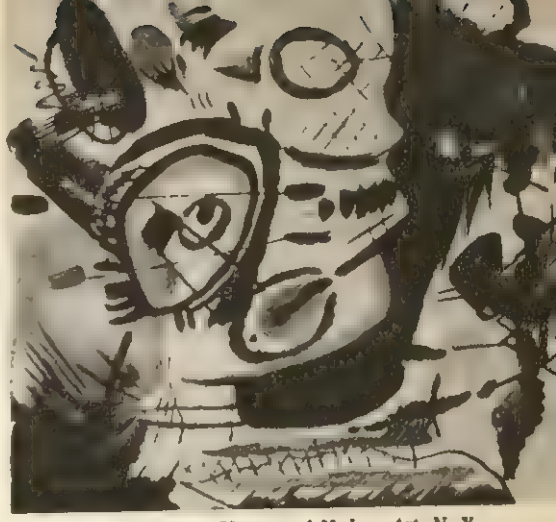
The walled city, built largely of mud, lies *ca.* 3,500 ft. above sea level. The regions to its south and west are highly cultivated and irrigated and produce pomegranates, melons, and grapes, as well as wheat, barley, and forage crops. Alexander the Great is said to have founded the original city, which fell successively to Genghis Khan, Timur, and the Persians. It was rebuilt in the 18th century by Ahmad Shah, founder of modern Afghanistan, who made it his capital. Population, *ca.* 77,000.

Kandinsky (*kăn-dĭn'skĭ*), VASILI, painter, born in Moscow, Russia, 1866; died in Paris, Dec. 17, 1944. He attended the Univ. of Odessa and was offered a professorship of law at the Univ. of Dorpat in Russia, but decided to become an artist and went on to Munich, Paris, and Berlin to study. In 1912, he and Franz Marc founded in Munich the international artistic movement known as the "Blue Rider." This movement included the pioneers of German expressionism (*q.v.*). He returned to Russia during World War I, and after the Revolution became associated with the Moscow Acad., also becoming director of the Museum of Pictorial Culture in Moscow. In 1920 he taught at the Univ. of Moscow and the following year founded the Russian Acad. of Artistic Sciences. From 1922 to 1932 he taught at the Bauhaus and in 1934 went to Paris to do his own work. He is internationally known as the dean of nonobjective painters, and his presentations of color compositions without obvious picturization have been widely exhibited in the U.S. He discussed his theories of painting in his book "Upon the Spiritual in Art" (1912).

Kandy (*kăn'dē*), a town in the island of Ceylon, located on an elevated plain, about 80 m. from Colombo. It has railway facilities, electric lights, and several large buildings occupied by the government. Near it are the famous botannical gardens of Peradenia. It contains the palace of its former kings and has several ancient monuments and Buddhist temples. Population, *ca.* 38,000.

Kane (*kān*), a borough of McKean County, Pennsylvania, 95 m. S.E. of Erie, on the Pennsylvania, the Baltimore & Ohio, and other railroads. The surrounding country produces oil and natural gas. Among the manufactures are glass, brushes, machinery, and lumber products. It has a healthful climate and is a favorite summer resort. Population, 1940, 6,133; in 1950, 5,706.

Kane, ELISHA KENT, Arctic explorer and scientist, born in Philadelphia, Pa., Feb. 3, 1820; died in Havana, Cuba, Feb. 6, 1857. He was graduated from the Univ. of Pennsylvania in 1842, when he received a doctor's degree, and the next year entered the U.S. Navy as a surgeon. In that capacity he served on the *Brandywine,* which



Courtesy Museum of Modern Art, N. Y.

COMPOSITION VII, FRAGMENT I

Painting by Vasili Kandinsky

carried Webster as U.S. minister to China, and while on the trip to the East he visited numerous countries of Eurasia. He returned to America in 1846, but soon after sailed under government orders to Africa. In 1850 he served as surveyor of the Gulf of Mexico for the U.S. government, and joined the Grinnell expedition the same year for the purpose of making a search for Sir John Franklin.

Kane was led to believe by observations made while on this tour that there was an open sea in the vicinity of the North Pole, and, for the purpose of testing this belief, he organized an expedition and sailed in May 1853, from New York in the *Advance*. On reaching 87° 43′ N. lat. the ship was frozen in the sea of ice for 21 months and after many hardships and privations the vessel was abandoned. After traveling in boats and sledges a distance of 1,300 m., he reached Greenland, and in November 1855, returned to New York. Being much impaired in health, he sailed for his health to Cuba, where he died. Knowledge of the Arctic regions was greatly extended by accounts of Kane's two expeditions, and he was awarded a gold medal by Congress. His publications include "Narrative of the Expedition in Search of Sir John Franklin" and "Second Grinnell Expedition in Search of Sir John Franklin."

Kangaroo (*kăng-ga-rōō'*), in the genus *Macropus,* the largest of all living marsupials, or pouched mammals, animals that bear their young alive but in a very incomplete state of development. The kangaroo has short fore limbs and hands; excessively long hind limbs and feet and a long powerful tail are adaptations for hopping and leaping along. When pressed for great speed, it can cover a distance of up to 20 ft. in a single leap. A large male kangaroo will measure up to 7 ft. in a standing position and weigh 200 lb.

Courtesy Australian News and Info. Bureau, N. Y.
KANGAROO

A grazing animal, the kangaroo feeds on herbaceous plants on the plains and prairies of New South Wales and in the open forests of Queensland, southwestern Australia, and Tasmania. Though timid and unaggressive, a kangaroo with its back to a tree can defend itself from a whole pack of dogs and will rip to shreds with the claws on its hind feet any individual that ventures within striking distance. In public parks, however, the kangaroo soon becomes friendly with visitors. A young kangaroo is known as a joey; a female rarely has more than one at a time. Carried in the mother's pouch for six months, the joey takes an interest in the outside world and ventures out of the pouch for brief periods toward the end of this time.

There are several species of kangaroos. The red kangaroo is the best known and has the widest range. The male is a brilliant red-wine color; the slenderer female has a smoky-blue color and has been called the blue flyer because of her extreme speed. The great kangaroo, or forester, is sociable in its habits and in the past traveled in herds, called "mobs," of several thousand. It has no fixed abode and rests at night on the ground.

Closely related to the kangaroo are a variety of other Australian marsupials, including the tree kangaroo, wallaroo, wallaby, pademelon, rat kangaroo, and musk kangaroo.

Kangaroo Island, an island in the Indian Ocean off the coast of southern Australia. It lies in the entrance to the Gulf of St. Vincent and is separated from Yorke Peninsula by Investigator Strait. With an area of *ca.* 1,700 sq. m., it has a length of 90 m. and a width of 33 m. In the western part of the island is a large (210 sq. m.) area, Flinders Chase, set aside for the preservation of characteristic Australian plants and animals. The principal towns are Kingscote and Peneshaw, which are centers of the resort industry. The only other settlement is Parndana, the center of an area where stock raising and dairying are now being developed. Chief products of the island are barley and other grains, eucalyptus oil, wool, and meat. Population, 1954, 2,522.

Kankakee (*kăng-kə-kē′*), a river of the U.S., rising near South Bend in Indiana. It flows in a southwestern direction across the border into Illinois. It then bends to the northwest at its juncture with the Iroquois just below Kankakee, Ill., and eventually joins the Des Plaines River to form the Illinois, a course of some 150 m.

Kankakee, a city in Illinois, seat of Kankakee County. Kankakee is on the Illinois Central and New York Central R.R.'s, in the heart of the Illinois corn belt. It is an agricultural trading center, and limestone quarries are located nearby. Kankakee's manufactures include furniture, stoves, farm machinery, and hosiery. It is the seat of Olivet Nazarene Coll. and of a state mental hospital. The town was settled in the 1850's and incorporated in 1855. Population, 1950, 25,856.

Kansas (*kăn′zəs*) or KAW, a river of the U.S. It is formed near Junction City, Kans., by the union of the Republican and Smoky Hill rivers. About 170 m. long, it is joined by the Big Blue and other rivers as it flows eastward to join the Missouri River at Kansas City. The valley of the Kansas is highly fertile, producing large quantities of fruits and cereals.

Kansas, a state in the West North Central section of the U.S., well known for its extensive wheat fields and an important producer of livestock and livestock products. Kansas is also an outstanding mineral producer and ranks sixth among the states in petroleum and fourth in natural-gas production. Industrially, the state is growing, with meat-packing and food-processing plants, flour mills, and oil refineries established in many places.

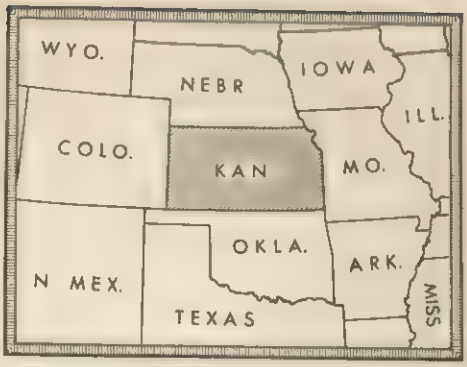
Kansas is bounded on the N. by Nebraska, on the E. by Missouri, on the S. by Oklahoma, and on the W. by Colorado. It ranks 14th in size and 28th in population, according to the 1960 Decennial Census of Population (the District of Columbia included in both rankings). The

state's name comes from a Siouan language and probably means "wind people" or "small wind"; the name was first applied to a Siouan tribe, then to the Kansas River. Popularly, Kansas is called the "Sunflower State." Kansas residents are referred to as "Jayhawkers," a name originally applied to antislavery men in Kansas and Missouri during the Civil War. The state has also been referred to as the "Central State" and the "Wheat State."

GEOGRAPHY

Kansas is an almost perfect rectangle in the center of the U.S. The exact geographical center of the mid-continental U.S. lies northwest of Lebanon in northern Kansas. Although known for its prairies and vast, rolling plains, Kansas rises to over 4,000 ft. in the west and slopes eastward to about 700 ft. in the southeast. The two principal rivers are the Kansas (locally, the

Location	Between 94°38′ and 102°1′ W. long. and 37° and 40° N. lat.
Area	82,264 sq. m.
Land	82,048 sq. m.
Inland water	216 sq. m.
Greatest extent:	
North to south	210 m.
East to west	410 m.
Population (1960)	2,178,611
Capital city	Topeka
Highest point	Near Weskan, Wallace County (4,026 ft.)
Lowest point	Near Coffeyville, Montgomery County, at the Verdigris River (700 ft.)
Admitted to the Union (34th state)	1861
Song	"Home on the Range," words by Dr. Brewster Higley, music by Dan Kelly
Flower	Sunflower
Bird	Western meadowlark
Motto	*Ad Astra Per Aspera* (Latin, meaning "To the Stars Through Difficulties")
Flag	See color plate in Vol. XI



Kaw) in the northeast, flowing eastward into the Missouri River, and the Arkansas in the southern half of the state, flowing southeastward to the Mississippi. Kansas is generally divided into three sections: east, central, and west. The east is notable for its gently rolling, fertile, green lands, excellent for grazing and for crop diversification. Well known here are the Flint Hills, limestone cliffs interspersed among the rolling plains, where the bluestem grasses grow. Central Kansas is characterized by the Smoky Hills Upland in the north, with its brown sandstone soil; the Blue Hills Upland a little to the west, with limestone formations; and the large flat central Great Bend Prairie, south of which rise the Cimarron Breaks, a line of eroded red cliffs and rocks. Across the western third of the state stretch the relatively flat, treeless High Plains, rising westward but practically unbroken in the central and southern sections. The flat, smooth lands of central and western Kansas have lent themselves to the cultivation of wheat.

Kansas offers many unusual geological sights. Among the numerous rock formations are the white, yellow, and orange rocks, including Castle Rock (70 ft. high), in Logan and Gove counties; the Monument Rocks shale and chalk bed remains near Oakley; and Rock City's more than 200 circular sandstone formations. South of Oakley along the Smoky Hill River are the largest cretaceous fossil beds in the country; and near Salina is an Indian burial pit with skeletal remains of prehistoric Indians believed to have been more than 6 ft. tall. Other phenomena include various "sinks," or undrained depressions, especially the Big and Little Basins in the south and Old Maid's Pool, 200 ft. deep, near Sharon Springs; as well as mesas, buttes, and caves.

The state has erected about 70 markers on historic sites, including many along the old Oregon and Santa Fe trails. A number of early missions have been preserved or restored. There are also several Indian reservations in Kansas, of which the Potawatomi (7,040 acres), west of Mayetta, is the largest.

Climate: Kansas summers can be very hot;

winters are usually mild. The western and eastern parts of the state contrast sharply in amount of rainfall, wind, and even sunshine. The east, particularly toward the south, tends to be the rainiest part of the state. The west is characterized by high winds, some droughts, and occasional dust storms. Tornadoes have hit the state often enough to earn it a reputation as a "tornado area."

Normal temperature, Wichita	
January	32.0° F.
July	80.9° F.
Annual mean	57.0° F.
Latest frost, Wichita	April 21
Earliest frost, Wichita	Sept. 27
Precipitation, Wichita	
January	1.05 in.
July	3.43 in.
Annual	30.70 in.
Average growing season, Wichita	200 days

Natural Resources

Kansas is an outstanding mineral producer. The state ranks third in the nation in natural-gas deposits and seventh in known petroleum reserves. One large natural-gas area lies in the southwest near the Texas-Oklahoma panhandle. South central Kansas has been active in producing oil. The salt deposits in central Kansas, around Hutchinson, are said to be among the greatest in the world. Lead and zinc are found in the southeast, and other minerals include coal, gypsum, and limestone.

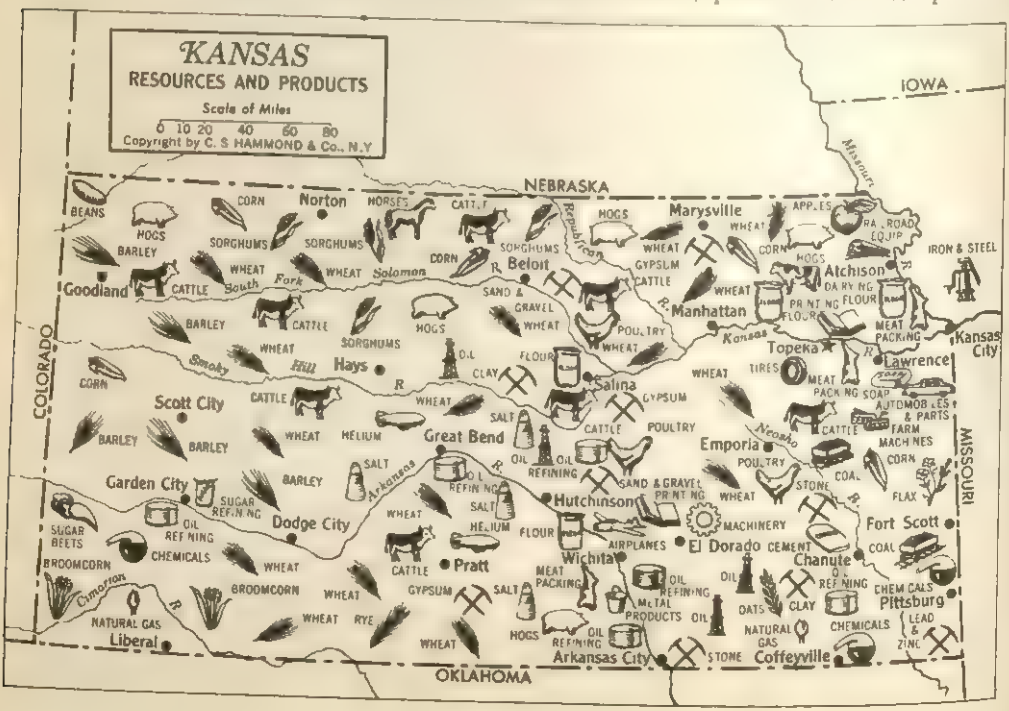
Very little of the state's water-power resources have been developed. In 1960 electric installations had a capacity of 2,036,000 kw.

Kansas, which is among the top ten agricultural states in the country, is highly dependent upon soil and water conservation. Among the noteworthy dams and reservoirs which have been constructed are Cedar Bluff Dam, 12,560 ft. long, with a lake of 6,600 acres, located 18 m. s.w. of Ellis; Kanopolis Dam, 15,810 ft. long, on the Smoky Hill River; Kirwin Dam, southeast of Phillipsburg, and Webster Dam, near Stockton, on the Solomon River in northern Kansas; and the Fall River Dam and Toronto Dam, near Eureka, in southeastern Kansas. The reservoirs often provide recreational facilities. In addition, there are wildlife and game preserves. Buffalo still roam in the Scott County State Park.

Kansas' Economy

At the time of the 1960 census, Kansas had an employed population of 783,877. Of this total, *ca.* 17 per cent were in manufacturing; 13 per cent in agriculture, forestry, and fisheries; 6 per cent in construction; and 2 per cent in mining. The remainder were employed in the selling trades, in government, and in supplying personal, professional, and other services.

The production of transportation equipment, particularly aircraft, is the most valuable industry. Other major manufactures include foodstuffs, particularly meat, grain, and dairy products; chemicals; petroleum and coal products;



ANNUAL STATE EVENTS

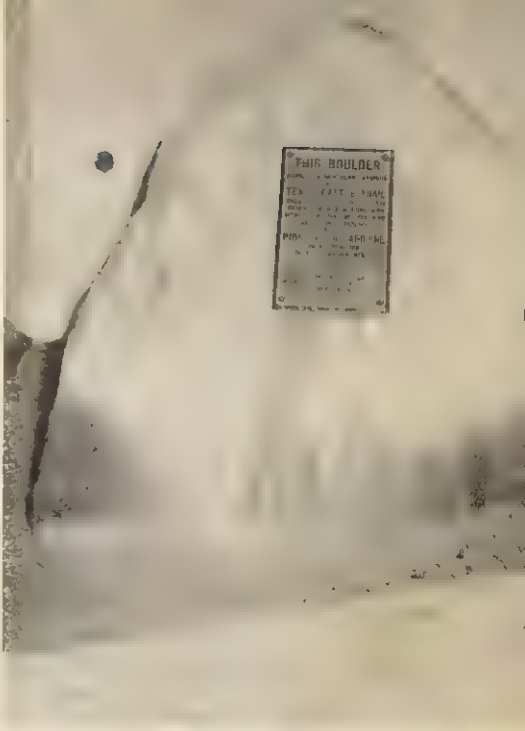
Kansas Day	Jan. 29; statewide
Square Dance Festival	Late March; Dodge City
Pancake Race (International)	Shrove Tuesday; Liberal; Kansas housewives in competition with Olney, England, housewives
Boot Hill Fiesta	First week in May; Dodge City
Powwow	July; Horton, 5 m. E. of Kickapoo Indian Reservation
Rodeo	Late July; Phillipsburg
Night Rodeo	Early August; Pretty Prairie
National Motorcycle Race	Labor Day week end; Dodge City; 200-m. race
State Fair	September; Hutchinson
Mid-America Fair	September; Topeka
Apple Harvest Festival	September; Troy
"Svensk Hyllningfest"	Early October; Lindsborg; tribute to Swedish pioneers
Arkalalah Celebration	Two-day Halloween festival; Arkansas City

and stone, clay, and glass products, including hydraulic cement and concrete. The state's value added by manufacture in 1961 was $1,227,064,000.

In 1959, with *ca.* 50,153,000 acres of farm land, the state ranked third in the nation in total farm acreage. There were in that year 104,347 farms, averaging 481 acres per farm and having an average value of $48,084.

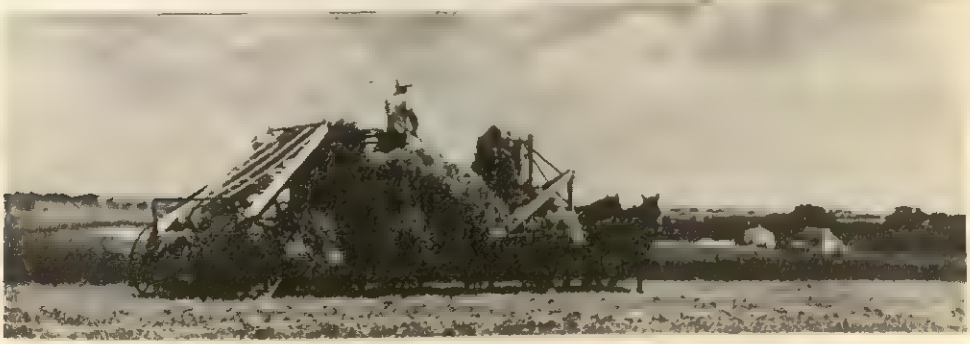
Kansas farmers derive about one-half of their marketing income from crops and one-half from livestock. In the livestock category, the most important products are cattle and calves, which normally account for more than one-third of total marketing receipts; hogs; milk; and eggs.

Wheat is the most important crop of the state. For many years Kansas has led the nation in wheat production, and it regularly derives one-third or more of its marketing receipts from sales of this grain. Other crops include sorghum grain, corn, soybeans, hay, and barley.



ON THE KANSAS SCENE

The state's history is commemorated by markers such as this one (*top*) at Abilene, at the end of the old Chisholm Trail. Corn (*right*) ranks with wheat and sorghum in the state's grain production. Increasing numbers of acres are being diverted from corn to the growing of sorghum grain. Hay (*below*) is an important crop to the many producers of livestock in Kansas (*courtesy Kansas Industrial Development Commission*)



Cash receipts from marketings of both crops and livestock totaled $1,342,030,000 in 1961. Only five states reported higher receipts for that year.

Kansas' mineral output was valued at $485,872,000 in 1961. This value comprised 2.68 per cent of the total U.S. output and placed the state ninth among the states. The principal minerals, in order of production value, were petroleum, natural gas, cement, and stone.

Transportation and Communication

The state had 133,132 m. of rural and municipal roads in 1960, of which 51,188 m. were nonsurfaced. Kansas ranks third in road mileage, exceeded only by Texas and California. Kansas is served by a number of railroads. The first railroad to operate in the state was the Marysville, Palmetto & Roseport R.R. (1860), now part of the Union Pacific R.R. Other railroads include the Atchison, Topeka & Santa Fe Ry., the Union Pacific R.R., and the Chicago, Rock Island & Pacific R.R. Railroad mileage in 1960 comprised 8,215 m. River transportation exists along the Missouri River. The state had 54 radio stations and ten television channels in 1961. The first newspaper published in the state was the *Shawnee Sun* (1835), written in an Indian language. The first English-language paper was the *Kansas Weekly Herald* (1854), published at Leavenworth. Today, the Wichita *Eagle* is a leading paper.

Population

Kansas has 105 counties. The state's 1960 census population was 2,178,611 (1962 est. population, 2,219,000). This represented an increase of 14.3 per cent over 1950. The urban population comprised 1,328,741, or 61 per cent; the rural population comprised 849,870, or 39 per cent. Between 1950 and 1960 the urban population rose 33.8 per cent. During that same period the rural population declined (for the fourth consecutive decade) by 6.8 per cent. More than one-third of the urban population lived in the urbanized areas of Wichita and Topeka. In 1960 white persons numbered 2,078,666; of the 99,945 nonwhites, the vast majority (91,445) were Negroes. The remainder included 5,069 Indians, 1,362 Japanese, and a sprinkling of Chinese, Filipinos, and others. Kansas' native-born residents totaled 2,145,350; the foreign-born totaled 33,268. Population density in 1960 averaged 26.6 per sq. m., but density varied widely, from under 3 per sq. m. in Wallace County to over 1,000 per sq. m. in Wyandotte County.

The major religious bodies are the American Baptist Convention; the Christian Churches, International Convention (Disciples of Christ); the Lutheran Church—Missouri Synod; The Methodist Church; the Protestant Episcopal Church in the U.S.A.; the Roman Catholic Church; and the United Presbyterian Church in the U.S.A.

Chief Cities: Wichita, in south central Kansas, is the state's largest city and an important oil-refining, meat-packing, and flour-milling center; it is also the world's largest producer of private airplanes.

Kansas City, in east central Kansas at the junction of the Kansas and Missouri rivers, opposite Kansas City, Mo., is the state's second-largest city and a meat-packing and grain-storage center.

Topeka, on the Kansas River, is the state capital; it has diversified industries and is the seat of the world-renowned Menninger (psychiatric) Clinic.

Famous Men and Women: Bickerdyke, Mary Ann Ball (1817-1901), Civil War army nurse; she encouraged some 300 families to migrate to Kansas after the war.

Capper, Arthur (1865-1951), newspaper pub-

FALL RIVER DAM AND RESERVOIR

The 2,600-acre reservoir, 20 m. N.W. of Fredonia, Kans., provides extensive recreation facilities

Courtesy Kansas Industrial Development Commission

INDIAN BURIAL PIT

Prehistoric Kansas is reflected in this communal grave discovered 4 m. E. of Salina. In it were the skeletal remains of more than 140 men 6 ft. or more in height, who are believed to antedate the explorations of Coronado. Over the burial pit is a building containing a large collection of Indian artifacts (*courtesy Kansas Industrial Development Commission*)

lisher, politician, who was governor (1915-19) and U.S. Senator (1919-49).

Chrysler, Walter P. (1875-1940), automobile manufacturer.

Curry, John Steuart (1897-1946), painter of Kansas life.

Curtis, Charles (1860-1936), Vice President of the U.S. (1929-33), who was also U.S. Senator (1907-13 and 1915-29).

Earhart, Amelia (1898-1937), aviator, the first woman to fly across the Atlantic.

Eisenhower, Dwight D. (1890-), 34th President of the U.S., who spent his boyhood in Abilene.

Funston, Fred (1865-1917), Ohio-born army officer, veteran of many wars; commanded the Kansas regiment in the Spanish-American War.

Inge, William (1913-), playwright, Pulitzer Prize winner (1955, "Picnic").

Johnson, Martin Elmer (1884-1937), Illinois-born explorer and wildlife photographer, who spent his boyhood in Kansas. His wife Osa L. Johnson Getts (1894-1953), born in Kansas, worked with him.

Landon, Alfred M. (1887-), Pennsylvania-born businessman and politician, governor of Kansas (1933-37), Republican nominee for President (1936).

Lane, James Henry (1814-66), lawyer and politician who helped secure admission of Kansas as a free state; he also served in the Mexican War.

Masters, Edgar Lee (1869-1950), poet and biographer.

Nation, Carry Amelia Moore (1846-1911), temperance leader who started her campaign in Kansas.

Robinson, Charles (1818-94), antislavery leader, first state governor (1861-63).

Runyon (Alfred) Damon (1884-1946), short-story writer and newspaper columnist.

Education

Education is free and compulsory for children between the ages of seven and 16. The state's public-school system was established in 1859. In 1962 public-school enrollment totaled 501,702 students. Enrollment in Roman Catholic parochial schools totaled 44,550 students in 1961. The leading state-supported institutions of higher education include Kansas State Teachers College, at Emporia; Kansas State Univ. of Agriculture and Applied Science, at Manhattan; and the Univ. of Kansas, at Lawrence. Private and denominational institutions of higher learning include Baker Univ., at Baldwin City; Friends Univ. and the Univ. of Wichita, at Wichita; Kansas Wesleyan Univ., at Salina; and Washburn Univ. of Topeka, at Topeka.

The state has many places of cultural interest. Among the museums containing mementoes of pioneer days are the Ft. Wallace Memorial Museum, the Ft. Hays Museum, the Jess Boyce Rock Garden and Museum in Phillipsburg, a museum in the Salina Public Library, the Salina County Historical Museum, and a museum at Ft. Leavenworth Military Reservation. Art collections are contained in the Wichita Art Museum, at the Wichita Art Assn. Galleries, at Washburn University's Mulvane Art Museum, and at the Spooner Thayer Art Museum in Lawrence. Other museums include the Dyche at Lawrence, with an extensive collection of fossils and mounted animals; the Wyandotte County Historical Museum, Kansas City; and the Kansas State Historical Society Museum, in Topeka.

Government

Kansas is governed under provisions of a constitution adopted in 1859, two years before it was admitted to statehood, and amended many times. The constitution gives executive authority to a governor, lieutenant governor, secretary of

state, auditor, treasurer, attorney general, and superintendent of public instruction, each elected for a two-year term. The legislature consists of a senate of 40 members, elected for four-year terms; and a house of representatives of 125 members, each serving two years. The legislature meets in Topeka, the capital city, for 60-day regular sessions on the second Tuesday in January of the odd-numbered years, and for 30-day budget sessions in the even-numbered years. The supreme court consists of seven members (a chief justice and six associate justices), appointed by the governor and subsequently elected. The judicial system also includes district courts, probate courts in each county, local courts, and justices of the peace. Kansas is represented in the U.S. Congress by two Senators and five Representatives.

History

Prior to the advent of the white man, Kansas belonged exclusively to the Indians, who hunted buffalo and warred among themselves. The first white men to enter (1541) the area were the Spaniards under Francisco Vásquez de Coronado on their search for the riches of Quivira. French fur traders explored some of Kansas in the late 17th century, and France claimed the region in 1682. Fort Orleans, established by the French in 1722, was destroyed by Kansas Indians three years later. After the French and Indian War, the French ceded all territory west of the Mississippi River to Spain in 1762, but they regained the area in 1801. In 1803 Kansas became part of the U.S. with the Louisiana Purchase. Explorations of the region were made by Lewis and Clark (1804) as well as Zebulon M. Pike (1807); fur traders, missionaries, and a scientific expedition headed by Maj. Stephen H. Long (1819) followed. The Indians arranged by treaty to give up some of their lands, and Congress authorized engineers to mark the Santa Fe Trail. Indians from eastern Kansas were settled in reservations after 1830, and more missions were established.

The great trek through Kansas began with the Mormon emigration westward from Illinois and Missouri in 1847 and was swelled by the thousands of miners, traders, and settlers who traveled overland to California in 1849 in the quest for gold. There were few actual settlers in Kansas before 1854. In that year the Territory of Kansas was created by the Kansas-Nebraska Act, which repealed the Missouri Compromise and by the doctrine of "popular sovereignty" left it to the people of the territory to decide whether they would have slaves. The act, plus the securing of further eastern territory from the Indians by treaty, stimulated settlement by proslavery squatters from Missouri as well as by antislavery emigrants from the North and East. The result was "bleeding Kansas," as the state became the focus of violent local and national conflict. Eventually, the free-state forces won out and Kansas was admitted to the Union in 1861; Kansas troops aided the North during the Civil War.

The postwar period saw the growth of cow towns and the development of railroads, but farmers faced crop failures. In 1874 Mennonite Russians found the land suitable for the growing of "Red Turkey" wheat; and as corn, livestock, and beet sugar also proved valuable, the farmers organized Grange societies. Woman's suffrage was achieved prior to World War I. During that war, Kansas furnished 81,650 service personnel. In World War II, Kansas fur-

MAJOR RECREATIONAL AND HISTORIC FEATURES

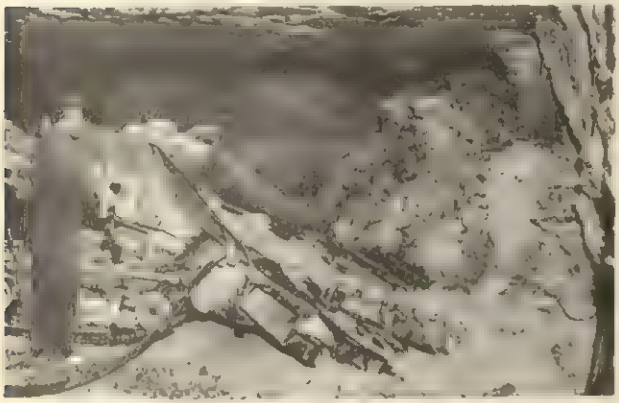
Name and Type	Size and Location	Points of Interest
Clark County State Park (established 1943)	1,243 acres in the south (U.S. 283)	Former Indian shelter; camping
Kingman County State Park (established 1930)	1,562 acres in south central Kansas (U.S. 54; state 14)	Fish and Game Commission Nursery and Quail Farm; camping
Meade County State Park (established 1927)	1,240 acres in the southwest (U.S. 54; state 98)	Pheasant hatchery; buffalo and elk herds; swimming; camping
Republic County State Park (established 1931)	1,064 acres in north central Kansas (U.S. 36, 81)	Camping, outdoor recreation
Scott County State Park (established 1930)	1,280 acres in the west, 12 m. N. of Scott City (U.S. 83)	El Quartelejo ruins dating back to 17th-century Pueblo Indians; buffalo sanctuary; scenic area
Cheyenne Bottoms	13,000 acres of water in south central Kansas (U.S. 281; state 4)	Outstanding waterfowl refuge; recreational area; public shooting grounds
Dwight D. Eisenhower's Boyhood Home (opened to the public 1947)	Abilene (U.S. 40; state 15)	Souvenirs, mementoes; museum
Old Shawnee Methodist Mission	Fairway (off U.S. 56)	Established 1830, moved to present site 1839; century-old buildings restored and furnished as in pioneer days
Hollenberg Station	Southeast of Hanover (U.S. 36, 77)	Original, unchanged Pony Express station; pioneer museum
Ft. Scott	Ft. Scott (U.S. 54, 69)	Frontier military post established 1842; contains a Civil War blockhouse and a 100-year-old officers' quarters and historical museum
Old Ft. Larned	6 m. W. of Larned (U.S. 156)	Established 1859; all buildings still standing; an excellent surviving example of a frontier military post.

THE POST OFFICE OAK

Council Grove's oak marked the mail cache for travelers on the Santa Fe Trail, a famous 19th-century route to the West

REPLICA OF DODGE CITY'S FRONT STREET

At the foot of Boot Hill, the main street of the old "cowboy capital" recaptures the era of cowboys, desperadoes, and frontier marshals



MINING SALT AT LYONS

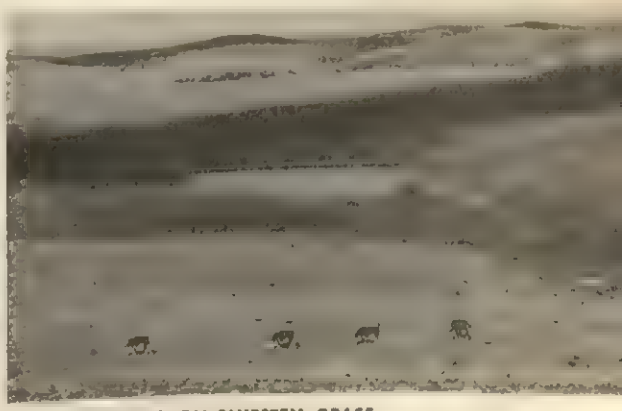
Deposits dating from prehistoric times, when the area was a shallow sea, make Kansas a major salt producer. Here, salt is mined below the surface of the earth

CUTTING THE GOLDEN GRAIN

Wheat fields stretch throughout western Kansas, the nation's leading wheat area, which makes Kansas a leading agricultural state

OIL REFINERY

Petroleum and natural gas are the state's most important mineral assets. Refineries like the one shown here are found all over Kansas



CATTLE GRAZING ON BLUESTEM GRASS

Cattle raised on the state's lush grasslands support the large dairy and meat-packing industries (*courtesy Kansas Industrial Development Commission*)

nished 208,771 men and women to the armed forces and stepped up its industry and agriculture to supply the nation with meat and flour products. Although Kansas is traditionally a top-ranking agricultural area, the postwar period has seen the greater growth of industry in the state, especially the manufacture of airplanes in and around Wichita.

See also separate entries on most of the individuals and geographical and historical subjects mentioned in this article.

Kansas, UNIVERSITY OF, a coeducational state institution of higher learning at Lawrence, Kans., opened in 1866. It comprises the graduate school, the Coll. of Liberal Arts and Sciences, and schools of business, education, engineering and architecture, fine arts, journalism, law, medicine, and pharmacy. The main medical campus is in Kansas City, Kans., and the university maintains four extension centers in the state. The library, which includes several specialized collections, has more than 800,000 volumes. The annual student enrollment totals *ca.* 9,250, and there are some 650 members of the faculty. The physical plant is valued at $45,000,000.

Kansas City, a city in northeastern Kansas, seat of Wyandotte County, the second-largest city in the state, located at the confluence of the Missouri and Kansas rivers, and separated by the state line from Kansas City, Mo. (*q.v.*). The city is served by seven railroads, including the Union Pacific, the Missouri Pacific, and the Kansas City Southern. The Municipal Airport lies 2.5 m. N.E. of the city.

SOLDIERS AND SAILORS MEMORIAL

A landmark in Kansas City, Kans., the memorial was completed in 1925

The city covers an area of 40.6 sq. m. and includes 25 parks, among them City Park and downtown Huron Park, a burial ground of the Wyandotte Indians and early settlers of the area. Notable buildings are the Soldiers and Sailors Memorial and the Roman Catholic Cathedral of St. Peter the Apostle. Olathe Naval Air Station is 20 m. s.w. of the city.

Kansas City is a leading center for grain storage and one of the nation's largest meat-packing areas; its industries also produce flour, oil, steel, lumber, and soap. The city forms a part of the Kansas City, Mo.-Kan., standard metropolitan statistical area (1,642 sq. m.; pop., 1960, 1,039,493), composed of Wyandotte and Johnson counties in Kansas and Jackson and Clay counties in Missouri. In 1958, the area had a value added by manufacture of $1,067,075,000. Kansas City had a value added of $221,076,000; the Kansas portion of the area alone produced a value added of $303,220,000.

The public-school system enrolls *ca.* 25,000 students annually; the parochial schools, *ca.* 5,000. Institutions of higher education include Central Baptist Theological Sem., the Univ. of Kansas school of medicine, the State School for the Blind, and Donnelly Coll. The public library houses more than 150,000 books.

The city is governed by a commission and a mayor, elected for four-year terms.

Kansas City had its inception in 1857, when Wyandotte was established on the site of an Indian village. In 1866 Wyandotte, Armourdale, Armstrong, and an earlier town named Kansas City united to form the present city. In 1910 and 1922, respectively, the towns of Argentine and Rosedale were annexed.

The periods of greatest population growth were from 1900 to 1910 (from 51,418 to 82,331), and in the years following World War II (121,458 in 1940 to 129,553 in 1950). The population in 1960 was 121,901.

Kansas City, a city and port of entry in western Missouri, in Jackson and Clay counties, the second-largest city in the state, at the confluence of the Missouri and Kansas rivers. The city is 129.8 sq. m. in area and is separated from Kansas City, Kans. (*q.v.*), by the state line.

DESCRIPTION: An important transportation and distribution center for the West and Southwest, Kansas City is served by 14 railroads, among them the Atchison, Topeka and Santa Fe Ry.; Burlington Route; Chicago Great Western Ry.; Chicago, Milwaukee, St. Paul and Pacific R.R.; Missouri Pacific Lines; Union Pacific Railroad; and Wabash R.R. System. The municipal airport lies to the north of the city.

There are more than 100 city-owned parks and playgrounds, of which the largest is Swope Park (1,756.9 acres). Here are located the Zoological Gardens and the Starlight Theater where light opera and musical comedy are presented outdoors during the summer season. The Municipal Stadium, home of the Kansas City Athletics baseball team, and the World War I Memorial are two major points of interest. The Cathedral of Immaculate Conception (Roman Catholic) and Grace and Holy Trinity Cathedral (Protestant Episcopal) are important religious structures.

KANSAS CITY, MISSOURI
View of the downtown section from Penn Valley Park

Main St. and Grand Ave. are two of the principal thoroughfares in the business district. The residential areas extend northeast from the business district and south along the state line. Southeast of Kansas City, at Grandview, is Richards-Gebaur Air Force Base. To the north, in Kansas, is historic Ft. Leavenworth (*q.v.*).

COMMERCE: Kansas City's most important business activities include grain storage and trading and the manufacture of farm and automotive equipment, food products, clothing, and chemicals. It is one of the nation's largest cattle markets. Kansas City standard metropolitan statistical area (1,642 sq. m.; pop., 1960, 1,039,493) is composed of Clay and Jackson counties in Missouri and Johnson and Wyandotte counties (including Kansas City, Kan.) in Kansas. The area's value added by manufacture was $1,067,075,000, of which Kansas City contributed $511,622,000. The Federal Reserve Bank, District 10, is located here.

EDUCATION AND CULTURAL INSTITUTIONS: The city's public and parochial schools enroll *ca.* 90,000 annually. Institutions of higher learning include the Univ. of Kansas City, Rockhurst Coll., the Coll. of St. Teresa, National Coll., and the Conservatory of Music.

The cultural facilities include the William Rockhill Nelson Gallery of Art and Mary Atkins Museum, the Kansas City Philharmonic Orchestra, the Linda Hall Library (science and technology), and, at nearby Independence (*q.v.*), the Harry S. Truman Library.

GOVERNMENT: Kansas City's government has the council-manager form. Eight councilmen and the mayor serve terms of four years; the manager serves at the pleasure of the council.

HISTORY: In 1821 a trading post was established in an area now within Kansas City, and the first permanent settlement was established at Independence in 1827. In 1833 Westport (now part of the city) was established and, with Independence, served to outfit the caravans of pioneers who were beginning to open up the West. A third community, at first called the Town of Kansas, was established in 1839 and grew important as the eastern terminus of the Santa Fe Trail and as supplier to the West and Southwest. Incorporated as a town in 1850 and reincorporated as the City of Kansas in 1853, Kansas City was incorporated in its present form in 1889.

POPULATION: The population in 1860 totaled 4,410, which increased to 32,260 in 1870, making this period one of the city's greatest in terms of population growth; another was the decade 1880-90 (55,785 to 132,716). Following a period of expansion after World War II, the population of Kansas City was 456,622 in 1950, and in 1960 it had risen to 475,539.

Kansas-Nebraska Act, the name of a bill introduced in the Congress of the U.S. by Stephen A. Douglas in 1854, which was passed in the same year. It is so named because it separated and organized the territories of Kansas and Nebraska, and its importance lies in the fact that it practically repealed the Missouri Compromise (*q.v.*). It embodies the idea of squatter sovereignty (see *Squatter*), *i.e.*, the question of slavery was to be settled by the people residing in the territories, and if they decided to adopt slavery the fugitive slave law was to apply. Nebraska was easily settled as a free territory, but the passage of the bill led to much trouble in Kansas. It was one of the causes that hastened the Civil War.

Kansu (*gän-sōō*), a province of northwestern China, near the Mongolian People's Republic in the north, and watered by the Hwang Ho and Hwei River. The eastern plains are fertile, and sandy plains characterize the northern parts, but on the whole the region is mountainous, with ranges as high as 20,000 ft. Opium is produced in quantity; other crops are millet, sorghum, corn,

and fruits. Animal husbandry is a principal occupation of the population, and hides, furs, and home-manufactured cloth are among the important products. Precious minerals, iron ore, petroleum, and coal have been found to exist, but most of the resources have not been fully exploited. Gold and quicksilver are exported.

Kansu constitutes one of China's wildest regions, due to its severe climate, isolation, and rugged terrain, factors which have contributed to the slowness of the area's full development. The single industrial center is Lanchow, also the capital and principal trading place. Ranking fourth among China's provinces in size (area, 145,930 sq. m.), Kansu is one of the most sparsely settled (population, 1941, 6,705,446). Proportionately few of the inhabitants are Chinese; Mohammedans and Mongols form the major portion of the population. There is a region in the northeast which is inhabited by "aborigines."

Kant (*känt*), IMMANUEL, philosopher, born in Königsberg, Germany, Apr. 22, 1724; died there Feb. 12, 1804. Though Kant's thought represents a revolutionary turning-point in the history of philosophy and was destined to exercise a profound influence upon almost all subsequent thinkers, his own life was unusually free from turbulence and external marks of great vitality. He continued to reside in his native town throughout his life, barely leaving its environs. He never married, lived prosaically, had few friends, and had no passion for any of the arts. His early upbringing was in a home dominated by the religious tradition of Pietism. He obtained the doctor's degree from the Univ. of Konigsberg in 1755, served for a time as tutor in the family of a local nobleman, subsequently became a librarian in the university, and was appointed to the chair of logic and metaphysics there in 1770.

Kant's mature philosophy was built in the grand manner, spacious enough to house all the traditional concerns of philosophers. His three great "Critiques," the most important of his works, can be regarded as attempts to deal systematically with the classical problems concerning the nature of truth, goodness, and beauty. As a young man Kant was heavily influenced by the rationalistic metaphysics of Leibnitz (*q.v.*); but according to his own confession he was awakened from his dogmatic slumbers and led to question the possibility of metaphysical knowledge by the writings of the English empiricist and skeptic David Hume. "The Critique of Pure Reason," the first of Kant's three "Critiques" and first published in 1771, is in effect an attempt to find a middle ground between the conflicting claims of rationalism and empiricism, and to supply a philosophical foundation for Newtonian science. Kant was convinced that there are many truths which the mind is compelled to accept as

IMMANUEL KANT

absolutely universal and absolutely necessary—truths such as those of geometry, arithmetic, and the principle of causality. However, he rejected the view of empiricists that these truths are derived from experience; and he also denied the rationalist assumption that these truths express objective traits of the world, which things possess in themselves irrespective of their relation to some knower. Kant argued, in opposition to these doctrines, that the mind is not simply passive with respect to experience, but imposes upon the materials of sense certain fixed forms and principles whose origin lies entirely in the human intellectual faculties. These forms (space and time) and principles (the principle of causality, the principle of the equality of action and reaction, and a number of others) are presupposed in all experience, for it is they which make experience intelligible. They are known to be universally and necessarily true in an *a priori* manner (that is, without depending on experience), because they represent the mind's legislative activity in forming judgments about nature. Accordingly, scientific knowledge is not knowledge of things-in-themselves, but only of phenomena—that is, of the world as it presents itself to the human intellect after it has been transformed by the mind's inherent machinery. Moreover, scientific knowledge is possible only of such matters as fall within space and time. Since, however, the traditional subjects of metaphysical inquiry—namely, God, freedom of the will, and the immortality of the soul—do not satisfy this condition, Kant maintained that they are not proper objects of scientific knowledge and that therefore a rationalistic metaphysics is impossible.

The second of the three "Critiques," the

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KAOLIN DEPOSIT

"Critique of Practical Reason," was published in 1788, and is concerned with the nature and source of moral standards. In this work Kant showed the influence of his Pietistic upbringing as well as of Rousseau's writings. In it he emphasized the rights of the human will and feelings against the claims of theoretical or scientific reason. He maintained that the test of goodness lies not in utility or pleasure, but in the character of the will which determines action. A will is good if it is directed toward the supreme moral law, the categorical imperative, which requires men to treat all human beings as ends, never as merely means. But a man can be a moral agent—that is, can act in accordance with the categorical imperative—only if he accepts this command freely and therefore possesses a free will; and Kant argued further that this fact implies the existence of God and the immortality of the soul. Thus, while Kant denied that these propositions can be established scientifically, he believed that they can be grounded in the data of moral experience.

In the "Critique of Judgment" (published during 1789-93) Kant examined the nature of beauty and of the apparent purposiveness of Nature. According to him, the sense of beauty arises when we perceive an inner harmony between objects apprehended scientifically and the forms imposed by the mind upon things when the mind is engaged in knowledge. On the other hand, he regarded the apparent purposiveness of Nature not as an inherent, objective trait of things, but simply as an inescapable guiding principle which men employ in order to endow natural events with meaning.

In addition to the three "Critiques" mentioned, Kant's writings include: "Natural History and Theory of the Heavens," "Prolegomena to Every Future Metaphysics," and "Metaphysical Foundations of Natural Science."

Kaolin (*kā′ō-lĭn*), a hydrated silicate of alumina, so named by the Chinese from a hill in China called Kaoling. It is a soft clay formed by the decomposition of rocks and contains mica, feldspar, and quartz. This product is now obtained in various parts of Germany, France, England, and the U.S. Deposits of considerable extent occur at Schneeberg, in Saxony; in Cornwall, England, and in various parts of Georgia, Pennsylvania, and Vermont. The proportion of silica to alumina varies in different countries. It is used extensively in the manufacture of porcelain and white earthenware and in paper making. It somewhat resembles mortar in the natural state, but becomes pure white when burned.

Kapok (*kā′pŏk*), a silky fiber obtained from the bombax, ceiba, chorisia, and ochroma trees, cultivated in Java and most tropical countries. The fibers are long and white, similar in appearance to cotton, and are buoyant, water-resisting, and moisture-proof. Because it is brittle, however, kapok does not lend itself to the process of spinning, and therefore does not compete on the textile market. Kapok, or Java cotton, as it is sometimes called, is used extensively in the production of life-preservers, temperature insulation, pillow stuffing, and similar commodities where its distinctive qualities make it especially valuable. The U.S. in 1942 imported 5,952 tons of kapok, representing about $1,500,000. The principal sources of supply are the Dominican Republic, Ecuador, Brazil, Malaya, Ceylon, and the Netherlands Indies. Kapok oil, obtained from the seeds of the kapok trees, is used in the production of soaps and margarine.

Karachi (*kä-rä'chē*), the national capital and second largest city in Pakistan, 12 m. from the delta of the Indus River, on the Arabian Sea. It is an important seaport, serving as a trade and distribution center for the extensive Indus valley. Situated 550 m. N.W. of Bombay, it is the nearest port to Europe on the subcontinent of India, and it is in heavy use as an airline terminal. Karachi is the seat of several institutions of higher learning. Exports include hides, wool, tallow, wheat, cotton, tea, and rice, and its manufactures are carpets, silk and cotton textiles, and silverware.

The village of Karachi was founded in 1725, but remained undeveloped until it came under British control in 1843 with the conquest of the province of Sind, of which it was the capital until 1950. By the end of the 19th century Karachi had grown to be one of the leading ports of India. During World War II, it was an essential supply base for the Allied forces stationed in India. Karachi became the capital of Pakistan in 1947. Population, *ca.* 360,000.

Karafuto (*kä'rä-fōō'tō*), name of the Japanese part of the island of Sakhalin (*q.v.*).

Karakorum Mountains (*kä-rä-kō'rŭm*), an elevated range in the central part of Asia, extending from the Himalayas into Kashmir and Eastern Turkestan. These mountains terminate at the Pamir, where they merge into the Hindu Kush. Mount Godwin-Austin, elevated 28,278 ft. above the sea, is the culminating peak and one of the highest summits in the world. The Karakorum Pass is one of many lofty passes that connect the intervening valleys.

Karamzin (*kä-räm-zēn'*), NICHOLAS MIKHAILOVITCH, historian and poet, born in Mikhailovka, Russia, Dec. 12, 1765; died June 3, 1826. He was the son of an army officer and was intended for a military career, but his aptness and preference for literary work caused him to study. In 1789, he traveled extensively in Switzerland, Germany, France, and England. His experience was published under the title, "Letters of a Russian Traveler," which was widely read. In 1802, he became the editor of the *European Messenger* and shortly after began his "History of the Russion Empire." He completed 11 volumes, his work terminating with the accession of Michael Romanoff (1596-1645), the founder of the last dynasty of Russia, who ascended the throne in 1613.

Karelo-Finnish Soviet Socialist Republic (*kä-rē'lō fin'ish*), 12th constituent republic of the U.S.S.R., lying between the Finnish border on the west, Lake Ladoga on the south, the White Sea and Lake Onega on the east, and the Kola Peninsula (Murmansk area) on the north. The Karelo-Finnish Soviet Socialist Republic was formed by the combination of the former autonomous Soviet Socialist Republic of Karelia with the territory ceded by Finland to Russia on Mar. 31, 1940, after the Finnish-Russian war. The capital is Petrozavodsk. The Leningrad-Murmansk railroad and White Sea-Baltic Canal intersect it from north to south. Karelia is rich in granite, marble, spar, quartz, and mica. It possesses resources of iron and copper ore, and produces, in normal times, one-fifth of the export timber of the U.S.S.R. Lumbering, paper manufacturing, and ski manufacturing are the main industries. There are three colleges, over 10 technical high schools, and scientific institutions.

Karelia was occupied by Finnish and German forces after Russia was attacked by Germany in World War II. With Germany's help, Finland temporarily regained the border territories that she had lost during the war of 1939-40. However, in 1944 she was forced to surrender, and in signing the peace treaty (Sept. 19, 1944) she agreed to withdraw her troops behind the 1940 frontier. Area of Karelo-Finnish Soviet Socialist Republic, 76,000 sq. m. Population, *ca.* 850,000.

Karikal (*kä-rī-käl'*), a town and district, until 1954 a French settlement, on the Coromandel coast of India, 150 m. s. of Madras, with an area of 53 sq. m. The French took possession in 1739, but the colony changed hands between the British and French from 1760 to 1817. It remained French from 1817 until 1954, when French possessions in India were transferred to Indian sovereignty. The town is a good port with trade in rice and betel nuts. Population, 1952, of the town, 24,600; of the district, 72,200.

Karlfeldt (*kärl'fĕlt*), ERIK AXEL, Swedish lyric poet, born in Folkäena, Sweden, July 20, 1864; died Apr. 8, 1931. After graduating from the Univ. of Upsala in 1893, he began teaching in private schools, joined the staff of the Royal Library of Stockholm in 1898, and five years later became librarian at the Agricultural Acad. in Stockholm. Karlfeldt's first collection of poems, "Vildmarks och kärleksvisor," appeared in 1895. His poems were immediately successful, and in 1904 he was admitted to the Swedish Acad., joining its Nobel Inst. a year later. In 1907 he was made a member of the Nobel Committee, and in 1912 became the academy's permanent secretary. Karlfeldt was offered the Nobel Prize for Literature in 1921, but refused on the ground that his works were not read outside of Sweden. In 1931 the prize was awarded to him posthumously.

Karlovy Vary (*kär-lōv'ĭ vär'ĭ*), German CARLSBAD or KARLSBAD, a city in Bohemia, Czechoslovakia, 116 m. N.W. of Prague, situated at the junction of the Tepl and Eger Rivers, surrounded by rocky, pine-covered mountains. It is famous for its healthful mineral springs which are said to have been discovered by the Emperor Charles IV (*q.v.*), for whom the spa is named.

The city is known for its hotel accommoda-

tions and bathing establishments, as well as entertainment facilities; it has attracted as many as 40,000 guests during the season from June to September. The pleasant and picturesque countryside affords many interesting excursions. The city normally supports a population of about 20,000 inhabitants and is the center of the porcelain and stoneware industry of Bohemia. Karlovy Vary is located in the Sudeten territory, which was annexed to Germany in 1938, and returned to Czechoslovakia in 1945.

Karlsbad (*kärlz'bäd*). See *Karlovy Vary*.

Karlsruhe (*kärls'rōō-ə*), a city in Germany, capital of Baden, 38 m. N.W. of Stuttgart, and on the Rhine River. It was founded in 1715 by Markgraf Karl Wilhelm. The city is built on a beautiful plan, and has several castles and palaces. The city possesses botanical gardens, a museum, and a well-known technological institute. It has manufactures of railroad cars, carriages, jewelry, locomotives, carpets, textiles, and chemical products. Following World War II it was placed under American occupation. Population, *ca.* 135,000.

Karma (*kär'mä*). See *Buddhism*.

Karrer (*kär'ĕr*), PAUL, Swiss chemist, born in Moscow, Russia, Apr. 29, 1889. A year after his graduation from the Univ. of Zurich (1911) he began his work on organic arsone compounds. His outstanding work has been in the investigation of sugars and polysaccharides, his research leading to new developments in dyeing processes. He also discovered the nonhomogeneity of tanning materials derived from tannin. In 1926 Karrer began his investigation of vegetable dyestuffs. He received the 1937 Nobel Prize in chemistry (with W.N. Haworth) for his research on carotinoids and on vitamins A and B_2.

Karst (*kärst*), term referring to the limestone mountain belt in the northwestern Dinaric Alps, Yugoslavia, and also to the geological characteristics of similar formations in other mountainous districts. In Yugoslavia, the region of the Karst extends from the Isonzo River to the Gulf of Quarnero. Karstic phenomena occur most widely in the Balkan area, featuring massive limestone rocks, caves, underground channels, and few visible rivers, since they disappear into deep subterranean caverns.

Kaschau (*kä'shou*), or KASSA, a city of Czechoslovakia, capital of the county of Adauj-Torna, 168 m. N.E. of Budapest, on the Hernád River. The surrounding country produces large quantities of wine and cereals. It has a fine Gothic cathedral, a law school, and a coeducational seminary for teachers. The manufactures include flour, paper, spirits, and clothing. In 1241 the region was settled by German colonists. It was the scene of a battle between the Austrians and the Hungarians in 1849, in which the latter were defeated. Population, over 50,000.

Kashân (*kä-shän'*), a city of Iran (Persia), in a province of the same name, 120 m. s. of Teheran. It has public baths, a Mohammedan college, and numerous mosques and bazaars. The city is famous for its carpets and textiles. Pop., *ca.* 45,000.

Kasher (*kä'shĕr*), or KOSHER, Hebrew meaning proper, fitting; term used to designate food which is fit by Hebrew law to be eaten. The term is especially applied to meat. Animals whose flesh is to be eaten must be killed following rabbinical, traditional ritual. Before it is eaten the meat must be soaked, salted, and washed. The word is also used for the cooking and serving of the food. The combination of meat with milk or dairy products, for instance, is forbidden. Certain animals and fish cannot be eaten.

Kashgar (*käsh-gär'*), a city of Chinese Turkestan located 4,043 feet above sea level. The city consists of two towns, Kuhna Shahr, or "old city" and Yangi Shahr, or "new city," which are about five miles apart. Situated at the crossroads of several routes leading to China and India, Kashgar has been long noted as a political and commercial center. It serves both as a marketplace for itinerant merchants and as a manufacturing center for cotton cloth, boots, shoes, and other articles for domestic use. Pop., *ca.* 65,000.

Kashmir (*käsh'mĕr*), or JAMMU AND KASHMIR, a state held by India, whose possession is disputed by Pakistan. It is bounded on the E. by Tibet, on the S. by the Indian Punjab, on the W. by Pakistan, and on the N. by Afghanistan and Sinkiang Province of China. Much of its area (85,861 sq. m.) is covered with high mountains, some belonging to the Himalayan and Karakorum ranges. It is drained by the upper Indus River and tributaries and the Jhelum River with its renowned "Vale of Kashmir." Agriculture, the chief industry, is devoted mainly to production of cereal crops and in the late 1950's was being revolutionized by land reform measures. Silk production is second in importance; handicrafts include cashmere shawls, carpets, wood carvings, and worked silver.

Predominantly Mohammedan since the 13th century, the state during the British colonial period was under Hindu rulers, the last of whom chose to join India rather than Pakistan after partitioning in 1947. Pakistan contested this and hostilities broke out between Kashmir's Moslems, backed by Pakistan, and its Hindus, backed by India. The dispute was referred to the United Nations and in January 1949 a cease-fire was arranged, pending a plebescite to determine the state's affiliation. With the plebescite still pending in 1960, settlement of the region's future was further complicated by Chinese territorial claims. Population, *ca.* 4,410,000.

Kaskaskia (*käs-käs'kī-ä*), a river in Illinois, rises in Champaign County, flows southeast and enters the Mississippi at Chester. It has a length

of 200 m. and is navigable for about 50 m. The first settlement in the state was founded by the French on the Kaskaskia River, about 7 m. from its mouth, in 1680. Kaskaskia was the first capital of Illinois. It is now a small post village. Population, 1900, 177; in 1940, 131.

Kassel (*kăs'sĕl*), a city of Germany, capital of Hesse-Nassau, 90 m. N.E. of Frankfort-on-the-Main. It is situated on both sides of the Fulda River, has extensive manufactures of ironware, locomotives, machinery, and scientific instruments. The art gallery is one of the finest in Germany. The city was anciently known as Chassala. In the Seven Years' War it was captured by the French, and became the capital of the kingdom of Westphalia in 1807. It was occupied by Prussian troops in 1866 and made a part of the kingdom of Prussia. A short distance west of the city is the Palace of Wilhelmshöhe, erected in the 18th century, in which Napoleon III was imprisoned at the close of the Franco-Prussian War (1870-71). Following World War II, it was placed in the American zone of occupation. Population, *ca.* 170,000.

Kasson (*kăs'sŭn*), JOHN ADAMS, public official, born in Charlotte, Vt., Jan. 11, 1822; died May 18, 1910. He was descended from Scotch-Irish parents, was graduated from the Univ. of Vermont in 1842, and began his career as a school teacher. Subsequently he studied law in a private office and practiced in St. Louis, and in 1857 removed to Iowa, where he became prominent in politics as a Republican. Lincoln appointed him First Assistant Postmaster General in 1861, and the following year he was elected to Congress for the first time. He was made a commissioner to the first international postal congress at Paris in 1863. In 1877 he became minister to Austria and served until 1881, when he returned to the U.S. and was elected to Congress. President Arthur made him minister to Germany in 1884, and he served as a U.S. representative at the International Congo and Samoa Conferences at Berlin. He negotiated the reciprocity treaty under the Dingley Act, and, in 1898, served as a member of the American-Canadian High Joint Commission. He published "History of the Formation of the U.S. Constitution."

Katahdin (*kà-tä'dĭn*), OR KTAADN, a celebrated mountain peak, the most elevated in Maine. It is situated in the central part of the state, about 80 m. N. of Bangor, and has an altitude of 5,268 ft. above sea level.

Katrine (*kăt'rĭn*), LOCH, a lake of Scotland, in Perthshire, 5 m. E. of Loch Lomond. It is 8 m. long and about 2 m. wide, and is visited annually by many tourists. Ellen's Isle, located in this lake, is the scene of Scott's "Lady of the Lake."

Kattegat (*kăt'ĕ-găt*), OR CATTEGAT, a gulf extending between Sweden and Denmark. It is an extension of the Skager-Rak from the North Sea. Its length is 150 m. and the greatest breadth is 90 m. The shores of Sweden are rocky and steep, but the Danish shores are low. There are sand banks more or less dangerous to navigation. Among its principal islands are Samsö, Läso, and Anholt.

Katydid (*kā'tŷ-dĭd*), a pale green insect, about 1½ in. long, allied to the grasshopper. Several widely distributed species have been studied. The name is an imitation of their peculiar note heard

Courtesy N. Y. Zoological Society

KATYDID

at night, which is caused by the friction of membranes attached to the covers of the wings. It is made only by the males, being a call to the noiseless females.

Kauai (*kow'ī*), an island of Hawaii, forming, with Niihau Island, Kauai County. Located in the northwestern part of the island group, it has an area of 551 sq. m. and is separated on the S.E. from Oahu Island by Kauai Channel. Mount Waialeale (5,080 ft.) covers a major portion of the island. Kauai has a heavy annual rainfall and more streams than any island in the state. The land is fertile, with sugar, pineapples, and rice the leading products. There are fine beaches. Waimea Canyon (3,000 ft. deep), in the southwestern section, has colorful formations similar to those of the Grand Canyon in Arizona. Along the northwestern coast are many caves, canyons, waterfalls, and the Napali Cliffs (4,000 ft.). It was in Kauai that Capt. James Cook (*q.v.*) made his initial landing in 1778. The chief

towns are Lihue (pop., 3,870), and Kapaa (pop., 3,177). Population, 1950, 29,683.

Kauffman (*kou'män*), ANGELICA, German artist and singer, born in Schwartzenberg, near Bregenz, in Tyrol, Oct. 30, 1741; died Nov. 5, 1807. Her early disposition to execute portraits caused her father to take her to Milan, where she studied the great masters. Later she visited various parts of Italy and studied at Rome, Venice, and Bologna. In 1765 she accompanied Lady Wentworth to London, where she secured a reputation as a painter of portraits and historic pictures. She married the Italian painter, Antonio Zucchi, in 1781, and returned to Rome, where she produced many excellent works. As a singer she took high rank and appeared in the society of nobles. Her chief paintings include: "The Hermitage," "Psyche Drying Cupid's Tears," "Ariadne and Theseus," "Christ and the Woman of Samaria," and "Virtue Directed by Prudence to Withstand the Solicitations of Folly."

Kaufman (*kôf'mạn*), GEORGE SIMON, playwright and director, born in Pittsburgh, Pa., Nov. 16, 1889; died in New York City, June 2, 1961. Educated in the public schools, he began writing humorous columns for Washington and New York newspapers. As drama critic for the New York *Times* and *Herald Tribune,* he had high standards, which served to raise the level of the entire field of theatrical criticism.

His greatest successes in writing for the theater have been in collaboration. With Moss Hart, he wrote "Once in a Lifetime" (1930), "You Can't Take It With You" (Pulitzer Prize, 1937), and "The Man Who Came to Dinner" (1939). With Edna Ferber, he wrote "The Royal Family" (1927), "Dinner at Eight" (1932), and "Stage Door" (1936). With Morrie Ryskind and George Gershwin, he wrote "Of Thee I Sing" (Pulitzer Prize, 1932). With J. P. Marquand, he adapted the latter's novel, "The Late George Apley" (1944). He directed Peter Ustinov's comedy, "Romanoff and Juliet" (1957). Kaufman's work became noted for its warm and tender, but sometimes biting, humor and a sense of the ridiculous that pierced pretension and sham. For picture, see *American Literature.*

Kaukauna (*kạ-kạ'nà*), a city in Outagamie County, Wisconsin, on the Fox River, 22 m. above Green Bay. It is on the Chicago & North Western R.R. Paper manufacturing is the chief industry. There are also two foundries, a machine-tool company, and a veneer factory. The city was founded in 1790 and incorporated in 1885. Population, 1940, 7,382; in 1960, 10,096.

Kaulbach (*kou'bäk*), WILHELM VON, historical painter, born at Arolsen, Germany, Oct. 15, 1805; died Apr. 7, 1874. He studied at Düsseldorf and Munich, and decorated the Odeon in the latter city with frescoes of Apollo and the Muses. In 1839 he went to Rome to make an extensive study of classic paintings and on returning to Germany decorated the hall of the Museum of Berlin. He was made director of the Munich Acad. in 1849 and resided in that city until his death. Among his noted paintings are: "The Crusaders Before Jerusalem," "The Battle of the Huns," and "The Battle of Salamis."

Kaunas (*kou'nàs*). See *Kovno.*

Kaunitz (*kou'nits*), WENZEL ANTON, PRINCE VON, statesman and diplomat, born in Vienna, Austria, Feb. 2, 1711; died June 27, 1794. He entered upon a public career under Charles VI, and by his successor, Maria Theresa, was sent on embassies to Rome, Turin, and Florence. In 1744, he was appointed minister to the court of the Austrian Netherlands. He represented Austria at the Congress of Aix-la-Chapelle, in 1748, where he demonstrated much ability as a diplomat, and soon after became minister of state. In 1750-52 he served as Austrian ambassador at Paris, concluding in the meantime an alliance between Austria and France. He was made chancellor of Austria in 1756, in which position he displayed extraordinary influence for more than 40 years, and sought to arrest the rise of the Prussian power by cultivating the friendship of Russia and France. With the ascension of Joseph II his influence waned, and he resigned his office (1792) when Francis II ascended the throne. His long political career was marked by a decided interest in strengthening the internal affairs of the German states, but giving preferences to Austria as against Prussia. He also gave much thought to the development of education, agriculture, and commerce.

Kaw (*kạ*), or KANSA, a tribe of Sioux Indians who formerly occupied the lower valley of the Kansas River, in Kansas. They speak a dialect of the Osage language. At the beginning of the 19th century they numbered about 1,300, but at present not more than 200 full-bloods remain. In 1846 they were removed to Oklahoma, where they occupy a reservation with the Osage Indians.

Kayak (*kī'äk*), Eskimo hunting canoe, constructed of sealskin stretched taut over a frame. There is a single opening in which the navigator sits, securing the hole from intake of water by fastening his skirt around the opening. Kayaks are propelled by hand-operated double paddles.

Kaye-Smith (*kā-smith*), SHEILA, writer, born near Hastings, England, in 1887; died near Rye, Sussex, Jan. 15, 1956. An author whose works reflect her interests in religion and in her home county of Sussex, she wrote in many literary forms. Her many novels include "Three Against the World" (1914), "Joanna Godden" (1921), "The End of the House of Alard" (1923), "Susan Spray" (1931), "The Secret Son" (1942), "Mrs. Gailey" (1951), and "The View from the Parsonage" (1954).

She also wrote poetry; an autobiography, "Three Ways Home" (1937); a semiautobiographical cookbook, "Kitchen Fugue" (1945); and two critical works on Jane Austen, with G. B. Stern.

Kazakh Soviet Socialist Republic (*ḳä-zäk'*), or KAZAKHSTAN, second largest and fifth most populous in the Union of Soviet Socialist Republics, embracing a territory of 1,056,000 sq. m. from a point 100 m. east of Stalingrad to the Chinese border. Although one-third as large as the U.S., this country has a population of 6,000,000 (1939). It is characterized by mountains and dry steppelands, which cover over 60 per cent of the area. In the north, however, the soil is fertile; in the east are the forested mountains of the Altai; in the southeast, the peaks of the Tian-Shan. The Irysh, Ural, Syr-Darya, Chi and Ili Rivers drain the territory. Karaganda is the largest city. The capital is Alma-Ata (population, 230,000). Kazakhstan leads the Soviet Republics in the production of non-ferrous metals, and ranks third in the output of coal. It is also rich in copper, lead, cobalt, nickel, tin, gold and antimony. There are large oil fields at Emba, coal mines at Karaganda, and deposits of phosphorites. Agriculture and stock raising are important occupations, and Kazakhstan is one of the largest stock-raising sections of the U.S.S.R. The most important grains are wheat and millet. Cotton is grown in the south on irrigated lands, as is the sugar beet, rice, tobacco, and the rubber-bearing koksagyz dandelion. There are large fisheries along the coasts of the Caspian and Aral Seas. Established as an autonomous Soviet Republic in 1920, Kazakhstan became a Union Republic in 1936.

Kazan (*ḳä-zän'y'*), the chief city and capital of the Tartar autonomous Soviet Socialist Republic, since 1920. It is on the Kazanka River, near its junction with the Volga. It is strongly fortified. The industries include tanneries, soap factories, machine shops, and establishments for wool combing, weaving, and dyeing. Near it is a government dockyard. Its convenient navigation and railroad facilities make it an important market for flour, hemp, timber, and cereals. As an educational center it ranks among the most important in Russia. The university, with an enrollment of 1,000 students, was founded by Alexander I, in 1804. It has a splendidly equipped observatory, botanical gardens, and a library of 100,000 volumes. Near the city are the shipyards in which Peter the Great built the Russian fleet, which became famous on the Caspian Sea during his reign. Kazan was founded in the 13th century, but originally the town was 30 m. farther east than the present location. It was the capital of the khanate of Kazan under the Tartars. The Russians under Ivan the Terrible captured it in 1552 after a prolonged siege. In 1918, Kazan was temporarily held by Czech forces, fighting against the revolutionaries. Population, *ca.* 400,000.

Kazbek (*ḳäz'bĕḳ*), one of the highest summits of the Caucasus Mts., containing several glaciers and two extinct volcanoes or craters, reaching a height of about 16,545 ft. The first successful ascent of the summit was made in 1868. It has been frequently alluded to in literature as the reputed locale of the punishment of Prometheus and the site of many folk legends. Russian poets refer to it as "Christ's Mountain," and "White Mountain." The village at its foot, also called Kazbek, boasts many antiquities.

Kazdaĝi (*ḳäz-dä-ī'*) or KAZ DAGH. See *Ida.*

Kean (*ḳēn*), CHARLES JOHN, actor, second son of Edmund Kean, born at Waterford, Ireland, Jan. 18, 1811; died Jan. 22, 1868. He studied at Eton and made his debut at Drury Lane in 1827. In 1830 he made a tour of Canada and the U.S., appearing with much success as *Young Norval* in "Douglas." For some years he toured with Ellen Tree, to whom he was married in 1842. In 1850 he became manager of the Princess's Theater, which he conducted with much success until 1859, presenting many of the Shakespearean plays. He made a tour of the world in 1868, visiting Jamaica, Australia, Canada, and the U.S. His death occurred in Chelsea, England.

Kean, EDMUND, actor, born in London, England, Mar. 17, 1787; died at Richmond, May 15, 1833. He was the son of Aaron Kean, a stage carpenter, and father of Charles John Kean, a noted tragedian. Edmund as a boy exhibited evidences of natural dramatic genius, and, after extended training, appeared in the character of

EDMUND KEAN AS RICHARD III

Shylock at the Drury Lane Theater, London, in 1814. Later he played with equal success as *Othello, Macbeth, Hamlet,* and other Shakespearean characters. Subsequently he made an extended visit to America. His last appearance as an actor was at Covent Garden in 1833.

Kearney (*kär'nī*), a city in Nebraska, county seat of Buffalo County, on the Platte River, about 135 m. N.W. of Lincoln. It is on the Union Pacific and the Burlington R.R.'s and is surrounded by a fertile stock and agricultural country. It is the seat of a state teachers college, the state hospital for the tubercular, and the State Boys Training School. Lake Kearney, which covers about 40 acres, is near the city. Among the manufactures are machinery, irrigation equipment, and food and concrete products. Kearney was founded in 1871 and incorporated in 1873. Population, 1900, 5,634; in 1950, 12,115.

Kearny, a town of Hudson County, New Jersey, located at the head of Newark Bay between the Passaic and Hackensack rivers, on the Erie and other railroads. It is an important manufacturing center with shipbuilding and oil refining as its leading industries. Kearny was separated from Harrison in 1867 and was named for Gen. Philip Kearny, a former resident of the area and a Union general in the Civil War. It was incorporated as a town in 1898. Population, 1940, 39,467; in 1950, 39,952.

Kearny, LAWRENCE, naval officer, born at Perth Amboy, N.J., Nov. 30, 1789; died there Nov. 29, 1868. In 1807 he entered the navy as a midshipman, serving in that capacity on the frigates *Constitution* and *President,* and became a lieutenant in 1813. During the War of 1812 he fought with distinction against the British. In 1821 he was sent to clear the West Indies and the Gulf of Mexico of piratical hordes. He was promoted to the rank of captain in 1832, secured commercial concessions from China in 1841, was made commodore in 1866 and placed on the retired list.

Kearny, PHILIP, soldier, born in New York City, June 2, 1815; slain at Chantilly, Va., Sept. 1, 1862. In 1837 he entered the army and two years later went to Europe to study French military tactics. After attending the cavalry school at Saumur, he enlisted in the French army, with which he rendered service during the campaigns in Algeria. He returned to America in 1840, was soon after attached to the staff of Gen. Scott, became captain in 1846, and lost an arm during an assault upon the city of Mexico. Later he served in the war against the Oregon Indians. In 1859 he re-entered the service of France, and for bravery at Solferino was decorated with the cross of the Legion of Honor. At the start of the Civil War he returned to America, was promoted to major general, and during an assault was killed in battle.

Kearny, STEPHEN W., general, uncle of Philip Kearny, born in Newark, N.J., Aug. 30, 1794; died in St. Louis, Oct. 31, 1848. He entered the army at the beginning of the War of 1812 as a lieutenant, was made captain the following year, and in 1846 became brigadier general, taking possession of New Mexico at the beginning of the Mexican War. In 1847 he was appointed governor of California. The following year he was made military governor of Vera Cruz and the city of Mexico. He wrote "Manual for the Exercise and Maneuvering of U.S. Dragoons" and several other works on military tactics.

Kearsarge (*kēr'särj*), a famous battleship of the U.S. during the Civil War. It was launched at Portsmouth, N.H., in 1861, and on June 19, 1864, engaged in battle the Confederate cruiser *Alabama* off the harbor of Cherbourg, France, disabling and sinking that vessel, which had destroyed a large part of the American merchant marine. In 1894 the *Kearsarge* was wrecked in the Caribbean Sea and burned by natives, though the officers and crew were saved.

Keats (*kēts*), JOHN, English poet, born in London, Oct. 29 or Oct. 31, 1795; died in Rome, Feb. 23, 1821. Although Keats died in his 26th year, nearly the entire volume of his work was done between the early months of 1816 and the end of 1819. Keats ranks high among English Romantic poets. Perhaps no English poet has ever accomplished more in so little time.

The first important influence leading Keats toward poetry came in his friendship with Charles

JOHN KEATS

Cowden Clarke, one of his teachers at Enfield, where he was sent to school from 1803 until 1811. It was Clarke, destined to be a lifelong friend of Keats, who first interested him in poetry and who guided his early reading. Keats' first great poetic enthusiasm was for Spenser, whose work remained an important influence throughout his poetic career. But he was also influenced by and learned much from Shakespeare and Milton, among the earlier English poets, and Leigh Hunt and Wordsworth among his contemporaries.

In 1811 Keats was apprenticed to an apothecary, with whom he remained until 1815, when he entered Guy's and St. Thomas's hospitals, completing his medical education in 1816. He did not practice his profession, however. It was in 1816 also that he published his first poem, in Leigh Hunt's *Examiner*. His first volume of poems was published in 1817. His greatest poem, "Hyperion," which was left incomplete, was written in 1818 and 1819. The year 1819 also produced "The Eve of St. Agnes," and his great odes: "On a Grecian Urn," "On Melancholy," "To a Nightingale," and "To Autumn." It is upon these poems and upon his sonnets that Keats' reputation largely rests. The tuberculosis of which he died in Rome in 1821, where he had gone for his health, allowed Keats to do very little work after 1819.

Keats' reputation among his contemporaries was not great. His publications were reviewed unsympathetically and were not widely read. Their merit was recognized by a small group, however, and his fame has grown steadily. In spite of poverty, relatively humble origin, and youth, he had a circle of loyal and devoted friends and considerable acquaintance among the great men of his time. Wordsworth, Lamb, Shelley, Hazlitt, Leigh Hunt, and Haydon were among his acquaintances.

Keats' poetry is especially notable for its rich, luxurious images, for its mastery of versification, and for the depths of personal feeling which Keats expresses in his greatest lyrics. But Keats has also been recognized in recent years to be worthy of serious study for the philosophical content of his poems.

Throughout Keats' work there is constant and rapid growth. His letters, which are among the most interesting in English literature, constitute an unusually full record of the development of a young poet and suggest that his growth would have continued. Had he lived, no doubt he would have achieved even higher rank among English poets. Since his best poems rank with the very best of their kind, however, there is no need to consider his youth in judging them. They stand on their own merits.

Keble (*kē'b'l*), JOHN, clergyman and poet, born in Fairford, England, Apr. 25, 1792; died at Bournemouth, Mar. 29, 1866. His early education was in his native town under the direction of his father. He entered Oxford at 15, where he made a creditable record, and in 1816 was ordained as a priest. Though manifesting a desire to fill a pastoral charge, he remained at Oxford as a public examiner in the school and as tutor at Oriel Coll. until 1823. Four years later he published a volume of religious poems entitled "The Christian Year." This book of poems had a wide circulation and went through 158 editions before 1872. He also worked on the tract movement for religious reforms.

Keck (*kĕe*), GEORGE FRED, architect, born in Watertown, Wis., May 17, 1895. Keck established his own office in 1926 and soon became known as a "modernist" and as a "functional" designer. He was commissioned to do the House of Tomorrow and the Crystal House at the Chicago Century of Progress Exposition in 1933. While working on the construction of those two designs, he discovered the solar principle of design—construction to capture solar heat for architectural purposes—and his work in this field has made him one of the country's 10 top architects. He was the principal architect for a group of 30 solar houses in Glenview, Ill., and has also been consultant to manufacturers in developing new building materials. From 1940 to 1944, Keck was head of the Department of Architecture of the Chicago School of Design. Since then he has concentrated his activities on the work of his own architectural office.

Kecskemet (*kĕch'kĕ-māt*), a town of Hungary, capital of the district of Pesth-Solt, 50 m. S.E. of Budapest. It is surrounded by an agricultural and stock-growing country, and is the seat of an important annual cattle fair. The chief buildings consist of grain elevators, several churches, and a number of secondary educational institutions. Most of the inhabitants are Magyars. Population, *ca.* 75,000.

Keefer (*kē'f'ĕr*), THOMAS COLTRIN, civil engineer, born at Thorold, Canada, in 1821. He studied at the Upper Canadian Coll., Toronto, and engaged as surveyor on the Erie Canal. Subsequently he was employed on the Welland Canal and in 1845 took charge of the Ottawa River improvements. The Dominion government employed him in 1850 to survey the rapids of the St. Lawrence and to take measurements from that river to the headwaters of the St. John, with the view of establishing communication by canal or railroad between the two rivers. Later he did extensive surveying for the Grand Trunk Ry. Co. In 1894 he published a report on the feasibility of constructing a ship canal between the Atlantic and the Great Lakes. He was commissioner at the London Exposition in 1862 and in Paris in 1878.

His publications include "The Philosophy of Railways." He died at Ottawa, Jan. 7, 1915.

Keel (*kēl*), the first part of a ship to be built; the expression *laying the keel* thus refers to the first work in constructing a ship. In a wooden vessel, it is the lower timber, corresponding to the spine, which gives the main support to the ribs and the whole structure. In wooden vessels an additional timber beneath is called a *false keel*, and a piece bolted to the keel on the inside is called the *keelson*.

Keeley (*kēl'ē*), LESLIE E., physician, born in St. Lawrence County, N.Y., in 1832; died in Los Angeles, Calif., Feb. 21, 1900. While young he went to Michigan and was graduated from the Chicago Rush Medical Coll. in 1864. He was a surgeon during the Civil War, and in 1866 opened his practice in Dwight, Ill. He gained a reputation for his treatment of alcoholism and narcotism as diseases. Subsequently he organized *Keeley Institutes* all over the country.

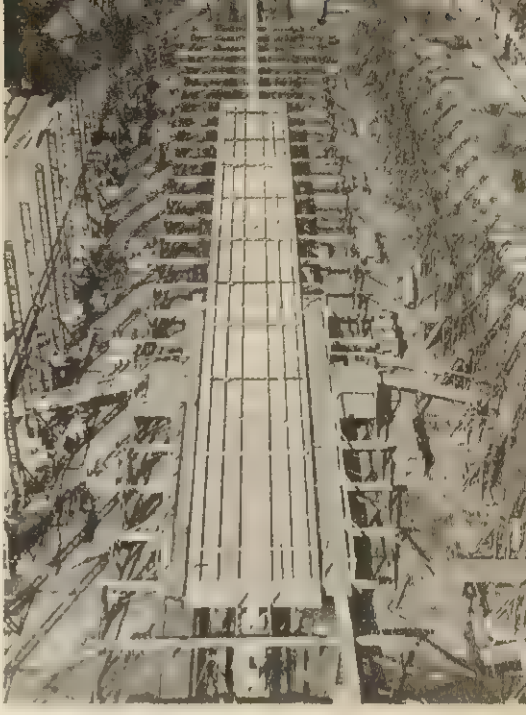
Keene (*kēn*), a city in southwestern New Hampshire, seat of Cheshire County, on the Ashuelot River, *ca.* 55 m. w. of Manchester, served by the Boston and Maine R.R. Surrounded by hills, it is *ca.* 10 m. from Mt. Monadnock. Keene manufactures machinery, textiles, leather products, primary and fabricated metals, paper and printing, and lumber and wood products. In 1958 the city had a value added by manufacture of $27,470,000. It was settled in 1734 as Upper Ashuelot and chartered as Keene in 1753. Population, 1960, 17,562.

Keene, a village in northeastern New York, in Essex County, on the Ausable River, 39 m. s.w. of Plattsburg. Situated at the upper end of Keene Valley, in the Adirondack Mts., the village is a popular summer resort. It was settled and incorporated in 1809. Population, 1960, 726.

Keene, LAURA, actress, born in London, England, in 1820; died in Monclair, N.J., Nov. 4, 1873. Her real name was Mary Moss. In 1847 she married Henry Wellington Taylor and toured in Australia, Canada, and the U.S. In 1858 she introduced in New York the successful comedy, "Our American Cousin." While she was presenting this play at Ford's Theater in Washington, D.C., in 1865, Abraham Lincoln was assassinated.

Keewatin (*kē-wä'tĭn*), a provisional district of the Northwest Territories, Canada, comprising 228,160 sq. m.; located between Saskatchewan and Hudson Bay. The district is sparsely populated.

Kefauver (*kē-fō'vĕr*), (CAREY) ESTES, U.S. Senator, born in Madisonville, Tenn., July 26, 1903; died in Bethesda, Md., Aug. 10, 1963. A graduate (1924) of the Univ. of Tennessee, he received a law degree (1927) from Yale Univ. and practiced (1927-39) in Chattanooga, Tenn. Elected (1939) to the U.S. House of Representatives, he served until 1949, when he won a Senate seat. Kefauver gained wide notice as chairman of Senate subcommittees investigating organized crime (1951) and price-fixing in industry (1962). In 1956 he ran unsuccessfully as Democratic candidate for Vice President.



Courtesy Federal Shipbuilding and Dry Dock Co., Kearny, N. J.

LAYING OF A KEEL

Keifer (*kē'fĕr*), JOSEPH WARREN, lawyer, soldier, and politician, born in Bethel Township, Ohio, Jan. 30, 1836; died in Springfield, Ohio, April 22, 1932. Keifer began to practice law in 1858. He served in the Union Army throughout the Civil War, becoming a major general (1865). He also fought in the Spanish-American War. A member of the U.S. House of Representatives (1877-85 and 1905-11), he was Speaker for two years (1881-83).

Keitel (*kīt'ĕl*), WILHELM, soldier, born near Brunswick, Germany, Sept. 22, 1882; executed Oct. 15, 1946. He entered the German army in 1901 and fought throughout World War I, attaining the rank of captain, later becoming a colonel (1931) and major general (1934). He was chief of the ministry of war (1935-38), and when Adolf Hitler took over direct command of the German armed services in February 1938, he appointed Keitel as his deputy commander. Keitel was present at the most important of Hitler's conferences throughout the war. His conclusion of the Franco-German armistice (June 1940) was a highlight in his career. As chief of the high command, he signed the German surrender in May 1945. He was hanged as a war criminal after his conviction at the Nuremberg trials (*q.v.*).

Keith (*kĕth*), SIR ARTHUR, anthropologist, born

in Aberdeen, Scotland, Feb. 5, 1866; died in Downe, England, Jan. 7, 1955. Keith served as a professor of physiology at the Royal Institution (1917-23), as its secretary (1922-26), and treasurer (1912-29). In 1933 he became master of the Buckston Brown Research Farm, Downe. While president of the British Assn. for the Advancement of Science, he delivered an address on the Darwin theory of evolution which precipitated a controversy. He published a justification of his interpretation, "Darwinism and What it Implies" (1928). He also wrote valuable books on his research in anthropology and anatomy, including "A History of the Human Body" (1912), "Nationality and Race" (1920), "New Discoveries Relating to the Antiquity of Man" (1931), "The Human Body" (1932), "The Construction of Man's Family Tree" (1934), "Darwinism and Its Critics" (1935), "Men of the Stone Age of Mt. Carmel" (in collab., 1939), and "An Autobiography" (1950).

Keller (*kĕl'ẽr*), GOTTFRIED, poet and novelist, born in Zürich, Switzerland, July 19, 1819; died July 17, 1890. Born of humble parents, Keller never had a formal education. Native instincts led him first to painting and then to politics, culminating, in 1846, with his turn towards literature. He is best known for his short stories, many of which are based about his native Swiss provincial life. "Der grüne Heinrich" is considered his masterpiece.

Keller (*kĕl'lẽr*), HELEN ADAMS, author, born in Tuscumbia, Ala., June 27, 1880. She descended from Alexander Spottswood, a colonial governor of Virginia. At the age of 19 months she suffered an attack of scarlet fever, which deprived her of her senses of sight and hearing, and also handicapped her in learning to speak. At the age of eight years she was placed under the care of Anne Mansfield Sullivan, who taught her to read and write and to use the finger alphabet. Subsequently she studied under Sarah Fuller, a former student of the Horace Mann School of New York, under whose instruction she learned to talk intelligibly. In 1904 she was graduated from Radcliffe Coll. Throughout her life she has proved that those deprived of sight and hearing may also participate in an active intellectual life. Among her writings are: "The Story of My Life" (1902), "Optimism" (1903), "The World I Live In" (1908), "The Song of the Stone Wall" (1910), "Out of the Dark" (1913), "My Religion" (1927), "Midstream, My Later Life" (1930), "Peace at Eventide" (1932), "Helen Keller in Scotland" (1933), "Helen Keller's Journal" (1938), and "Let Us Have Faith" (1940).

HELEN KELLER

NBC Photo

Kellermann (*kĕl'lẽr-män*), FRANÇOIS CHRISTOPHE, Duke of Valmy and Marshal of France, born in Strasbourg, Germany, May 30, 1735; died Sept. 12, 1820. He served in the Seven Years' War as a volunteer in the French army, supported the Revolution of 1789, and in 1791 became general in Alsace. Later he distinguished himself in the French expedition to Italy, and for his service Napoleon named him successively senator, marshal of France, and Duke of Valmy. He voted for the deposition of the emperor in 1814, and later supported the liberals in the high chamber.

Kellermann, FRANÇOIS ÉTIENNE DE, soldier, born at Metz, France, Aug. 4, 1770; died June 2, 1835. Kellermann followed the footsteps of his father, the Duke of Valmy, a famous French general, and achieved great distinction as a military leader. He was one of the generals of Napoleon, and led the charge which turned the tide in favor of the French at the Battle of Marengo (1800). He also demonstrated his military ability and experience in the Battles of Austerlitz and Waterloo. He strongly opposed the reign of the Bourbons.

Kellogg (*kĕl'lŏg*), CLARA LOUISE, operatic singer, born in Sumterville, S.C., in 1842; died at Elpstone, Conn., May 13, 1916. She secured her education in New York City, where she sang in the Academy of Music. Subsequently she became known in all the leading countries of the world. Her most popular roles were in "Il Poliuto" and "Faust."

Kellogg, FRANK BILLINGS, statesman, born in Potsdam, N.Y., Dec. 22, 1856; died in 1937. He began the practice of law at Rochester, Minn., as city attorney and later as county attorney, and in 1887 removed to St. Paul. About this time he was employed by the U.S. government in actions against the so-called trusts of the Standard Oil Co. and the railway merger attempted by the Union Pacific with the Southern Pacific lines. He

Courtesy N. Y. Academy of Medicine

FRANK B. KELLOGG

was prominent in the proceedings instituted by the Interstate Commerce Commission against the railways controlled by E. H. Harriman (*q.v.*). In 1912 Kellogg was elected president of the American Bar Assn. As U.S. Senator from Minnesota (1917-23) he was an advocate of military preparedness. He served (1924-25) as U.S. ambassador to Great Britain and, in 1925, succeeded Charles E. Hughes (*q.v.*) as Secretary of State. He helped settle the long-standing Tacna-Arica dispute between Chile and Peru. In 1928, under Kellogg's guidance, the U.S. signed the Pact of Paris, often called the Kellogg-Briand Pact, designed to outlaw war; for his part in this pact Kellogg was awarded the 1929 Nobel Peace Prize. He resigned his cabinet post in 1929 and served (1930-35) as a judge of the Permanent Court of International Justice at The Hague.

Kells (*kĕlz*), a town (pop., 1951, 2,124) of County Meath, Ireland, on the Blackwater River. It is the site of a monastery, founded *ca.* 550 by St. Columba. Here was produced the *Book of Kells,* an 8th-century illuminated manuscript of the Latin Gospels, now one of the treasures of the library of Trinity Coll., Dublin. Generally regarded as the finest example of medieval Celtic illumination, the manuscript has an illustration at the beginning of each Gospel and each chapter and beautifully intricate decorations of capital letters and borders.

Kelly (*kĕl'ĭ*), COLIN P., aviator, born in Monticello, Fla., July 11, 1915; killed in action in the Philippine Islands, Dec. 9, 1941. The first American hero of World War II, Kelly was a graduate (1937) of the U.S. Military Acad. He bombed and sank the Japanese battleship *Haruna.* After ordering his crew to parachute from his damaged plane, Capt. Kelly crashed and was killed. He was posthumously awarded the Distinguished Service Cross.

Kelly, GEORGE, dramatist, born in Philadelphia, Pa., in 1887. Privately educated, he became a vaudeville actor at the age of 21 and wrote a number of one-act plays. His first full-length play, "The Torchbearers" (1922), satirized amateur theatricals. "Craig's Wife" (1925) is a devastating exposé of feminine lovelessness and materialism; it won the Pulitzer Prize in 1926. Kelly's later plays include "Daisy Mayme" (1926), "Reflected Glory" (1936), "The Deep Mrs. Sykes" (1945), and "The Fatal Weakness" (1946).

Kelly, HOWARD ATWOOD, surgeon and gynecologist, born in Camden, N.J., Feb. 20, 1858; died in Baltimore, Md., Jan. 12, 1943. He was educated at the Univ. of Pennsylvania, graduated from its medical school in 1882, and served (1888-89) as associate professor of obstetrics there. He was professor of obstetrics and gynecology (1889-99) and of gynecology (1899-1919) at Johns Hopkins Univ. and gynecological surgeon (1899-1919) at Johns Hopkins Hospital. He early advocated the treatment of cancer by radium and was a cofounder of the National Radium Inst.

Kelly, JOHN, politician, born in New York City, April 20, 1822; died there, June 1, 1886. Powerful in politics at an early age, he at first opposed Tammany Hall but later (1853) joined the organization and became a city alderman. Following a term in Congress (1855-59), he was sheriff of New York (1859-61, 1865-67) and city comptroller (1876-80). After the exposure and downfall of W. M. Tweed (*q.v.*), Kelly, popularly called "Honest John," assumed control of Tammany. This position enabled him to influence the outcome of New York City elections. Retiring in 1882, he delegated his power to Richard Croker (*q.v.*).

Kelly, WILLIAM, inventor, born in Pittsburgh, Pa., Aug. 21, 1811; died in Louisville, Ky., Feb. 11, 1888. He claimed to be the original discoverer of the process by which molten iron is changed to steel, which was patented by Sir Henry Bessemer (*q.v.*). The patent office at Washington recognized his right to the invention, but the claim of Bessemer was then pending, which cut heavily into Kelly's royalties. The Kelly and Bessemer interests ultimately consolidated and retained Bessemer's name.

Kelp (*kĕlp*), the common name for a number of large brown seaweeds, chiefly those found along the Pacific coast of North and South America. Some species grow to be hundreds of feet in length, with strong, ropelike stems attached to the ocean bottom and widely branching growths held near the surface by air sacs.

Today, these and other brown seaweeds are harvested chiefly for the production of a gelatinous substance, called algin, used in ice cream. Formerly they were a chief source of various chemicals, including iodine, and during the World War shortages they were harvested for these substances. The dead, washed-up remnants of such seaweeds are widely used as fertilizers.

Kelvin (*kĕl'vĭn*), LORD. See *Thomson, Sir William.*

Kemal Pasha (*kę-mäl' pä-shä'*), given the title ATATURK (chief Turk), statesman, born in Salonika in 1881; died in Istanbul, 1938. He started his career in the military preparatory school in Constantinople. In 1894 he formed, in Damascus, the secret revolutionary society "Fatherland," and as chief of the Turkish general staff helped crush the counter-revolution in Constantinople (1909). Commander of a division during World War I, he was dismissed for his participation in the movement in Asia Minor against the Greeks (1919). He then founded his own National Assembly in Erzerum and Sivas (1919), being elected president of the National Assembly and of the Provisional Government (Angora, Apr. 23, 1920). After the abolition of the sultanate and caliphate, he was elected unanimously first president of the Turkish Republic (Oct. 28, 1923). He brought about many modern reforms in Turkey, including abolition of monasteries, ancient dress, and polygamy; also, introduction of the Gregorian calendar, the Roman alphabet, rights for women, and modern civil and penal codes. Although on good terms with Russia, he tried to unite the whole Balkan region by treaties of friendship.

KEMAL PASHA

Kemble (*kĕm'b'l*), FRANCES ANNE, authoress and actress, born in London, England, Nov. 27, 1809; died Jan. 15, 1893. She gave readings from Shakespeare with remarkable success in the U.S. and Great Britain. She is the author of: "A Year of Consolation," "Francis the First," "Record of a Girlhood," and "Journal of a Residence on a Georgian Plantation."

Kemble, JOHN PHILIP, tragedian, born in Prescott, Lancashire, England, Feb. 1, 1757; died in Lausanne, Switzerland, Feb. 20, 1823. He is noted for his *Hamlet*.

Kemmel (*kĕm'ęl*), MOUNT, a forested hill 5 m. s.w. of Ypres, Belgium, captured by the Germans in World War I on Apr. 27, 1918, and held by them as the key to the south side of the Ypres salient, one of the most important sectors of the western front. The 27th U.S. Division, after relieving British forces in the salient, captured Mt. Kemmel in fighting that lasted from Aug. 31 to Sept. 2, 1918.

Kempis (*kĕm'pĭs*), THOMAS A, medieval mystic theologian, born at Kempen, near Cologne, Germany, *ca.* 1380; died 1471. He attended the famous school of Deventer maintained by the Brethren of the Common Life. In 1399, he entered the Augustinian monastery of Mt. St. Agnes, near Zwolle, and received orders in 1413. He spent his life as a copyist of manuscripts and in the preparation of a number of original works, chiefly on monastic life. The original draft of his most important book, "De Imitatione Christi" ("The Imitation of Christ"), dates back to about 1418. It has very often been stated that he himself did not write it, but only compiled it from the teachings of the Brethren of the Common Life, a sect which was founded by Gerhard Groot (Gerardus Magnus, 1340-80). It cannot be denied that "The Imitation of Christ" has much in common with the teachings of Groot, with regard to its recommendation of asceticism (*q.v.*) and to its mystical insight. In any case, no other devotional book has had as much influence on Christianity as "The Imitation of Christ." It has been re-edited about 5,000 times and probably translated into more languages than any other work except the Bible. In essence the "Imitation" states that in order to become a real Christian and obtain remission of one's sins one must really suffer with Christ.

Kenai (*kē'nī*), a peninsula in Alaska between Cook Inlet and Prince William Sound, *ca.* 160 m. long and 130 m. wide. It is so irregular that the coast line is more than 1,000 m. long. The heavily forested Kenai Mts. extend down its center; in the northwest the land is low lying. The region abounds in game and fish. The Alaska R.R. and two highways connect the seaports of Seward and Kenai with Anchorage.

Kendal (*kĕn'd'l*), DAME MADGE, actress, born in Great Grimsby, England, March 15, 1849; died Sept. 14, 1935. Her real name was Margaret Robertson. She married W. H. Grimston (Mr. Kendal) in 1869, and they made a theatrical team from that time. She made her London debut as *Ophelia* in "Hamlet" as the Haymarket Theater in 1865. Her most popular roles were always Shakespearean, including *Rosalind* in "As You Like It" and *Mistress Ford* in "The Merry Wives of Windsor." After 1889 she made several suc-

cessful American tours. She was made a Dame of the British Empire in 1926.

Kendall (*kĕn'd'l*), AMOS, politician, born in Dunstable, Mass., Aug. 16, 1789; died in Washington, D.C., Nov. 12, 1869. A graduate (1811) of Dartmouth Coll., he studied law and went to Kentucky in 1814. After entering politics (*ca.* 1816) as a supporter of Henry Clay (in whose house he had been a tutor for a year), he switched to Andrew Jackson and became a prominent member of the "Kitchen Cabinet" and a vigorous partisan of the administration. In 1835 he was appointed Postmaster General under Jackson, and he held the post during most of Van Buren's administration. Later he became business agent, on a percentage basis, for Samuel F. B. Morse and acquired a fortune from Morse's telegraph interests.

Kenilworth (*kĕn'il-wûrth*), a market town of Warwickshire, England, situated on a tributary of the Avon, about 99 m. N.W. of London. It is noted for its castle, which, until the year 1562, was a crown possession, and at that time was given to Robert Dudley, earl of Leicester (*q.v.*), by Queen Elizabeth. He entertained the queen there in 1575. Sir Walter Scott's novel, "Kenilworth," is based upon this visit. Population, *ca.* 10,000.

Kenites (*kē'nīts*), a Biblical tribe first mentioned in the Old Testament (Genesis 15:19), as a branch of the Midianites. In 1 Samuel 15:6 they are referred to as friendly to King David.

Kennebec (*kĕn'nę-bĕk*), a river of Maine, next to the Penobscot the most important in the state. It rises in Moosehead Lake, has a general course toward the south, and flows into the Atlantic Ocean. The length is 150 m., falling more than 1,000 ft. in the course from the source to the mouth. It is navigable for large ships to Bath. On its banks are Bath, Augusta, and Waterville.

Kennedy (*kĕn'ę-dĭ*), JOHN FITZGERALD, 35th President of the U.S., born in Brookline, Mass. May 29, 1917; died in Dallas, Texas, Nov. 22, 1963. He was the son of Joseph P. Kennedy (1888-), a financier and U.S. ambassador to Great Britain, 1937-40. He studied at Harvard Univ. (B.S., *cum laude*, 1940) and in World War II served in the Navy and was awarded the Purple Heart. A Democrat, he represented Massachusetts in the U.S. House of Representatives, 1947-53, and in the Senate, 1953-60. After stating his belief (1959), as a Roman Catholic, that the principle of separation of Church and State was "fundamental to our American concept and heritage, and should remain so," he became a leading contender for the 1960 Democratic Presidential nomination. Nominated at the party's convention in Los Angeles, he won the election against Richard M. Nixon (*q.v.*) by a remarkably close popular margin but by an electoral vote of 303 to 219. In

JOHN F. KENNEDY

his Inaugural Address, noted for its style, he stressed the need for international cooperation and his administration's willingness to defend political freedom throughout the world. Although the Congresses elected in 1960 and 1962 included more conservative members than their immediate predecessors, Kennedy succeeded in passage of parts of his liberal program. His efforts as President, tragically cut short by an assassin's bullet, were devoted to mediation between extremist views. While his extensive civil-rights proposal was before Congress shortly before his death, he insisted that full employment would take precedence over anything else. In foreign policy, his outstanding achievements were his insistence on the removal by the U.S.S.R. of offensive weapons from the island of Cuba (*q.v.*) and in reaching a general *détente* in East West relations. See also *United States*.

Kennedy, ROBERT FRANCIS, government official, born in Brookline, Mass., Nov. 20, 1925; a brother of John F. Kennedy (*q.v.*). He was graduated from Harvard Univ. in 1948 and received his law degree in 1951. He was admitted to the bar and joined the Criminal Division of the U.S. Dept. of Justice. In 1952 he managed his brother's successful senatorial election campaign and in 1953 became assistant counsel, and in 1955 counsel, of the Senate permanent subcommittee on investigation. He became widely known as chief counsel (1957-59) of the Senate Select Committee to Investigate Improper Activities in Labor-Management Relations, under Sen. John L. McClellan (D., Ark.). Kennedy also managed the Democratic Presidential campaign in 1960 and in 1961 became Attorney General of the U.S., setting a precedent by serving a President who was his close relative.

Kennesaw Mountain (*kĕn'ę-sô moun'tĭn*) OR KENESAW MOUNTAIN, BATTLE OF, a Civil War engagement near Marietta, Ga., on June 27, 1864. General W. T. Sherman, with a Union force of *ca.* 100,000 men, undertook to march from Chat-

tanooga to Atlanta, but only *ca.* 16,000 men took part in the battle. At Kennesaw Mt., he came into contact with Confederate troops under Gen. J. E. Johnston, who repelled the Union assault, inflicting 2,000 casualties. The Confederates retreated, however, on July 1, after Union forces under Gen. T. B. McPherson moved to envelop their position. The site was established as a National Battlefield Park in 1947.

Kenney (*kĕn'ĭ*), GEORGE CHURCHILL, army officer, organization executive, born in Yarmouth, N.S., Aug. 6, 1889. After working as a civil engineer, he entered the U.S. Army in 1917 and remained in the service after World War I. In 1942 he was a lieutenant general and commander of the 4th Air Force; later in the year he became head of Allied air forces in the southwestern Pacific. In 1945, with the temporary rank of general, he headed five air forces (the Pacific Air Command). After World War II, promoted to the permanent rank of major general, he was head of the U.S. Strategic Air Command (1946-48). Before retiring as a general in 1951, he was active at the U.S. Air Univ. He later was appointed president of the National Arthritis and Rheumatism Foundation. "General Kenney Reports" (1948) and "The MacArthur I Know" (1951) are his publications.

Kenny (*kĕn'ĭ*), ELIZABETH (SISTER KENNY), nurse and founder of the Kenny method of treating poliomyelitis (infantile paralysis), born in Queensland, Australia, 1884; died in Toowoomba, Queensland, Nov. 11, 1952. Despite much opposition, her method of treating polio victims (which involves relieving the muscle spasm characteristic of the disease by use of heat, strips of woolen blankets, water, and especially massage of the afflicted areas) finally won recognition in her native land. Used not as a cure-all but as an important aid in the treatment of the disease, the Kenny method has also found many supporters in the U.S. since she first demonstrated it here in 1940.

Kenora (*kē-nō'rȧ*). See *Rat Portage.*

Kenosha (*kę-nō'shą*), a city in southeastern Wisconsin, seat of Kenosha County, on Lake Michigan, 28 m. s. of Milwaukee. It is on the Chicago and North Western Ry. Surrounded by farming country, the city is primarily industrial. Among the manufactures are automobiles, machinery, furniture, hosiery, and clothing. It is the center of Kenosha Standard Metropolitan Statistical Area (pop., 1960, 100,615). The value added by manufacture for the city alone was $162,363,000 in 1958. Kenosha was settled in 1835 and incorporated in 1850. The population grew from 11,606 in 1900 to 67,899 in 1960, with the largest increase occurring between 1910 and 1920—from 21,371 to 40,472.

Kensington Gardens (*kĕn'zĭng-tŭn gär'dn'z*), a park about 2 m. in circumference, situated in the city of London, England. It extends west of Hyde Park, from which it is separated by the Serpentine. Near the northwestern part is Kensington Palace, which was purchased in 1689 by William III and served as a royal residence for more than a century.

Kent (*kĕnt*), JAMES, jurist, born in Fredericksburgh, N.Y., July 31, 1763; died Dec. 12, 1847. In 1781 he was graduated from Yale Coll. and afterward studied law. He was admitted to the bar in 1785 and established a practice at Poughkeepsie. After serving two terms in the state legislature, he was professor of law at Columbia Coll., 1794-98. He was successively appointed master in chancery, recorder, judge of the supreme court, and chief justice, serving in the last-named position 10 years. In 1814 he became chancellor of the state, serving nine years, and was again professor of law at Columbia Coll., 1824-25. As a judge of law and an advocate he takes high rank. He published a treatise entitled "Commentaries on American Law," which is accepted as a general standard.

Kent, ROCKWELL, artist, born in Tarrytown Heights, N.Y., 1882. After graduating from Columbia Univ., Kent studied painting, and by the time he was 25, had already made a name for himself with his canvases on Maine subjects. Although primarily a landscape and figure painter, he has done distinguished work in lithographs and wood engravings. He has illustrated books, including those from his own pen. Traveling extensively in Alaska, Greenland, Labrador, and South America, he brought home many impressions utilized in his vigorous and dramatic work.

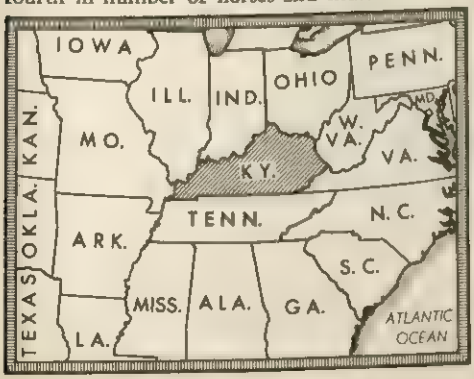
Kenton (*kĕn'tŭn*), a city in northwestern Ohio, seat of Hardin County, on the Scioto River, 70 m. N.W. of Columbus. It is on the Erie, the New York Central, and other railroads. An industrial community that is surrounded by an agricultural area noted for its onions, Kenton manufactures pharmaceuticals and steel, foundry and food products. The site was settled in 1833 and the city incorporated in 1885. Population, 1960, 8,747.

Kenton, SIMON, hunter and pioneer, born in Fauquier County, Virginia, Apr. 3, 1755; died Apr. 29, 1836. When 16 years of age, he engaged in an affray with a rival in love, and, thinking he had killed his adversary, fled to Kentucky, where he became associated with Daniel Boone as a spy against the the Indians. In 1778 he was captured by the Indians, but escaped. He became major of a battalion of Kentucky volunteers in 1793, and aided in the expeditions to guard the western frontiers. He was made brigadier general of Ohio militia in 1805, fought in the War of 1812, and after its close lost his vast possessions in Kentucky by the encroachment of settlers and his failure to secure a legal title to his lands. In 1824 he appeared before the Ken-

tucky legislature in tattered garments and petitioned for relief. His request was granted, and later Congress voted him a pension of $240 a year.

Kentucky (*kĕn-tŭk'ĭ*), a river of Kentucky, formed in Lee County by the junction, at Beattyville, of three forks which rise in the Cumberland Mts. The river, 259 m. long, flows northward through coal and iron regions, passing through a gorge cut of limestone and the bluegrass farm country. At Carrollton (midway between Louisville, Ky., and Cincinnati, Ohio), it empties into the Ohio River. The Kentucky is navigable to Frankfort, Kentucky's capital.

Kentucky, a state in the East South Central section of the U.S., known as the home of thoroughbred horses and traditional plantation homes. Kentucky is also an important mining state and is rapidly growing in manufactures, as well. The largest of the Tennessee Valley Authority dams, Kentucky Dam, is at Paducah. Kentucky is the nation's second-largest producer of tobacco; it ranks third in coal production, and fourth in number of horses and mules.



Kentucky is bounded on the N. by the Ohio River, which separates it from Ohio, Indiana, and Illinois; on the E. by West Virginia and Virginia; on the S. by Tennessee; and on the W. by the Mississippi River, which separates it from Missouri. It ranks 37th among the states in area and 22nd in population, according to the 1960 Decennial Census of Population (the District of Columbia is included in both rankings). The state's name comes from the Indian word "Kentuckee" and is thought to mean "land of tomorrow." Its nickname, "Bluegrass State," refers to the fields of bluish-green grass which cover the central part of the state.

Location	Between 82° and 89°33′ W. long. and 36°30′ and 39°6′ N. lat.
Area	40,395 sq. m.
Land	39,863 sq. m.
Inland water	532 sq. m.
Greatest extent:	
North to south	175 m.
East to west	350 m.
Population (1960)	3,038,156
Capital city	Frankfort
Highest point	Black Mt. (4,145 ft.)
Lowest point	Mississippi River (257 ft.)
Admitted to the Union (15th state)	1792
Song	"My Old Kentucky Home," words and music by Stephen C. Foster
Flower	Goldenrod
Bird	Kentucky cardinal
Motto	"United We Stand, Divided We Fall"
Flag	See color plate in Vol. XI

Geography

The terrain of Kentucky slopes generally downward from east to west and from south to north. The eastern third of the state is covered by the Cumberland Mts., a region of thin, sharp ridges and narrow valleys. The streams in the valleys flow northeast to empty into the Ohio River, which forms Kentucky's northern border. In the extreme southeastern corner is the Cumberland Gap, a mountain pass through which poured many of the early settlers of Kentucky and the other states of the Old Northwest. Along the western edge of the Cumberland region, the mountains are worn down, and they gradually merge into the plain. Thick hardwood forest still covers much of the Cumberland country. Elevations in eastern Kentucky range from about 500 ft. in some of the valleys to the highest point in the state, Black Mt. (4,145 ft.).

The rest of Kentucky may be divided into two regions: a river plain and a plateau. Following the course of the Ohio River is a rolling plain, sometimes forming a narrow strip along the river, but in two places swelling out into a circular basin. The westernmost of these basins is formed by the Cumberland and Tennessee rivers, which flow into the Ohio near Paducah. A large lake in the Tennessee has been formed

by Kentucky Dam. In southwestern Kentucky is a region of low wooded ridges in which the state's principal supply of coal is found. This area centers in Muhlenberg and Hopkins counties. Another coal region is located around Harlan, Bell, Perry, and Letcher counties in the Cumberland region. Elevations in the plains area range between 257 ft., on the banks of the Mississippi, to about 500 ft.

Southern and central Kentucky is part of a plateau reaching up from Tennessee. Much of this plateau is underlaid with a soft limestone which is easily eaten away by water. The result has been the formation of many underground caves and sinkholes, or collapsed caves, that dimple the plain. The plateau region extends in one area to the banks of the Ohio, where the river runs under high bluffs. Much of this upland is covered with rich bluegrass pasture.

All of Kentucky lies in the Mississippi River watershed, most of the streams of the state reaching that river by way of the Ohio. Among the larger rivers are the Tennessee, which joins the Ohio at Paducah; the Cumberland, another Ohio tributary; the Green; the Kentucky; and the Licking rivers. The Ohio forms the whole northern border of the state, while the Mississippi forms about 75 m. of the western border.

Among the interesting landmarks of Kentucky, perhaps none is more impressive than Mammoth Cave, a cavern more than 150 m. long, still not completely explored. Enormous vaulted chambers have been carved out by the dissolving action of the water on the limestone, while pillars of stone are built up century after century by the dripping of lime-bearing water. Kentucky was the birthplace of the leaders on both sides of the Civil War. Abraham Lincoln's birthplace was a humble cabin, now preserved at Hodgenville. Jefferson Davis was born in Fairview, where a monument in the form of a 351-ft. tower affords an excellent view of the countryside. The bygone life of plantation days is preserved at "My Old Kentucky Home," the old mansion of Judge John Rowan, near Bardstown. This handsome building, where Stephen Foster is said to have visited, was the inspiration for his famous song. At Columbus, on the Mississippi in western Kentucky, was the Confederate Gibraltar. Here, a great chain, which may still be seen, was stretched across the river as a barrier to Union gunboats. At Blue Licks Battlefield a memorial marks the site of the last battle of the Revolution (1782), an engagement between settlers and Indians allied with the British, long after the surrender of Cornwallis in Virginia. A view of life in pioneer times can be had at the Levi Jackson State Park, near London, where a group of early farm buildings has been made into a museum, and at Harrodsburg, where a typical frontier stronghold, Ft. Harrod, has been reproduced.

ANNUAL STATE EVENTS

Keeneland Races	Early April and early October; Lexington
Churchill Downs Race Meet	Late April and late October; Louisville
Kentucky Derby	First Saturday in May; famous racing classic for thoroughbreds; includes many festivities
Mountain Laurel Festival	Late May; Pineville
American Folk Song Festival	Second Sunday in June; Ashland
Junior League Horse Show	Early July; Lexington
Trotting Races	Late September; Lexington
State Fair	September; Louisville

Climate: Kentucky has a generally mild climate, but summers are fairly hot, averaging about 75° F. Winters are short and not severe, except that heavy snowfalls sometimes occur in the mountainous eastern region. Rainfall is more than adequate for farming in all parts of the state. The lowlands of western Kentucky are much warmer and more humid than the eastern and central highlands and mountains.

Normal temperature, Louisville	
January	35.6° F.
July	78.6° F.
Annual mean	57.3° F.
Latest frost, Louisville	April 1
Earliest frost, Louisville	Nov. 7
Precipitation, Louisville	
January	4.07 in.
July	3.07 in.
Annual	41.60 in.
Average growing season, Louisville	221 days

Natural Resources

Kentucky was once largely covered with forest, most of which, except for the mountainous eastern part of the state, has long since been cut. The soil of this ancient forest has proved well suited to the raising of fine tobacco. After more than a century of cultivation, this remains the leading crop. Two main types of tobacco are grown—dark, fire-cured leaf in the southwest, and bright Burley leaf in central and southern Kentucky. The bluegrass fields of central and northern Kentucky are excellent pasture, and here are raised most of the world's finest thoroughbred race horses, as well as beef and dairy cattle. Corn can be raised almost everywhere in Kentucky and, together with such other grains as barley, wheat, and rye, forms the basis of a large distilling industry. Other crops which the long growing season and rich soil produce include oats, hay, sorghum, potatoes, sweet potatoes, and strawberries.

Kentucky is an important mineral-producing state, ranking third in the nation in production of coal. In southeastern Kentucky, 10,450 sq. m.

of land is underlaid with coal, while another coalfield in the northeastern part of the state is 4,680 sq. m. in extent. Other minerals of importance include petroleum, fluorspar, natural gas, limestone, clay, glass sands, and smaller deposits of rock, asphalt, iron, zinc, and lead.

Forests, mostly in the Cumberland region of eastern Kentucky, are another source of wealth. They cover some 11,497,000 acres, and the live sawtimber amounts to 27,342,000,000 bd. ft. Oak and hickory trees predominate in Kentucky, but there are also loblolly pine, poplar, maple, beech, ash, basswood, and black walnut.

Conservation is fostered by the state government, which engages in such activities as the stocking of streams with game fish and the raising of deer, pheasant, and turkey for sportsmen. Regulation of hunting seasons and practices and the establishment of several game refuges have preserved the state's wildlife. Kentucky was one of the states to benefit from the TVA project of the Federal government, which controlled the floods of the Tennessee River and provided electric power, navigable waterways, and recreational lake resorts.

Kentucky's Economy

At the time of the 1960 census, Kentucky had an employed population of 935,944. Of this total, *ca.* 21 per cent were in manufacturing; 14 per cent in agriculture, forestry, and fisheries; 6 per cent in construction; and 4 per cent in mining. The remainder were employed in the wholesale and retail trades, in government, and in supplying various personal, professional, and other services.

Food and kindred products, including distilled beverages, are the most valuable type of manufacture in the state. Other important manufactured products are chemicals, cigarettes and other tobacco products, nonelectrical machinery (particularly for the construction industry), fabricated metal products (particularly structural parts), and apparel (particularly men's and boys' wear). The state's total value added by manufacture in 1961 was $1,984,961,000.

There were 150,986 farms in 1959, occupying a total of 17,031,000 acres. The average farm had 113 acres, with land and buildings valued at $15,269.

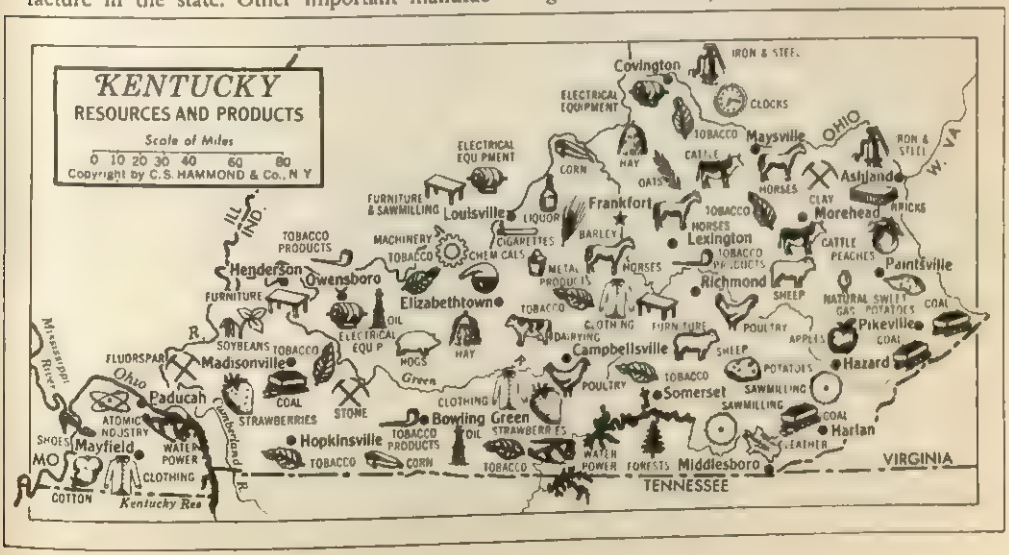
The most important agricultural product is tobacco, which accounted for 43 per cent of all farm marketing receipts in 1961. Other crops of importance include corn, soybeans, and wheat. Sales of crops yielded 52 per cent of all farm marketing receipts in 1961.

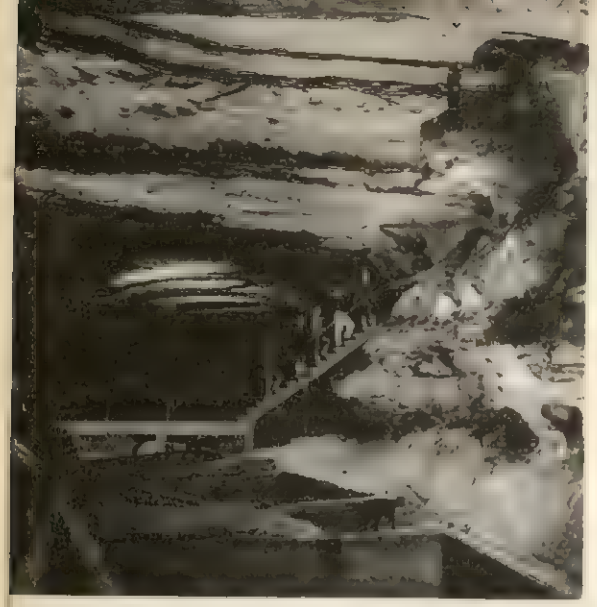
The sources of livestock income are sales of cattle and calves, milk, and hogs, which together accounted for 40 per cent of total marketing receipts in 1961. Other major livestock products include eggs and broilers. The total receipts from all sales of crops, livestock, and livestock products amounted to $635,940,000 in 1961.

Kentucky's mineral output was valued at $386,013,000 in 1961. This total comprised 2.13 per cent of the total U.S. value and placed the state 15th among the states. The principal minerals, in order of production value, were coal, petroleum, stone, and natural gas.

Transportation and Communication

Almost 600 m. of the Ohio River borders Kentucky. This stream, with its tributaries—the Kentucky, the Tennessee, and the Cumberland rivers—provides a water highway for the transport of bulky goods. Barge lines operate on more than 1,400 m. of waterway within the state (including the Ohio River).





The first railroad to operate in Kentucky was the Lexington & Ohio R.R. in 1830, now part of the Louisville & Nashville R.R. Other major railroads include the Baltimore & Ohio R.R., the Chesapeake and Ohio Ry., the Illinois Central R.R., the Kentucky & Tennessee Ry., and the Southern Ry. Railroad mileage in 1960 was 3,526 m. In the same year, the state had 69,514 m. of rural and municipal roads, of which 15,784 m. were nonsurfaced. All the principal cities of the state have airfields.

The first newspaper published in the state was the *Kentucky Gazette* (1787), in Lexington. Today's leading newspapers are the Louisville *Courier-Journal*, the Lexington *Herald*, the Middlesboro *Daily News*, and the Ashland *Daily Independent*. Kentucky had 101 radio stations and six television channels in 1961.

Population

Kentucky has 120 counties. The 1960 census population was 3,038,156 (1962 est. population, 3,082,000), an increase of 3.2 per cent over 1950. The urban population comprised 1,353,215, or 44.5 per cent; the rural population, 1,684,941, or 55.5 per cent. Between 1950 and 1960 the urban population increased 24.8 per cent and the rural population declined 9.4 per cent. More than 65 per cent of the 1960 urban population lived in the urbanized areas of Louisville, Huntington-Ashland, and Lexington. In 1960 white persons numbered 2,820,083; of the 218,073 nonwhites, the great majority (215,949) were Negroes, with a sprinkling of Japanese, Indians, Chinese, Filipinos, and others. Kentucky's native-born residents totaled 3,021,326; the foreign-born 16,830. Population density in 1960 averaged 76.2 per sq. m.

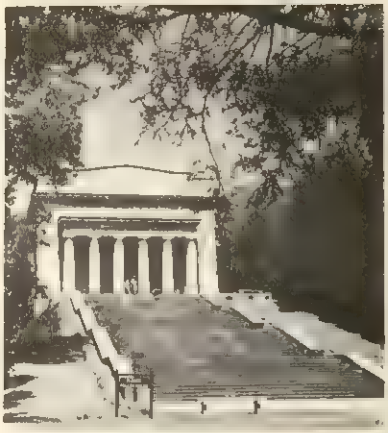
The major religious bodies are the Christian Churches, International Convention (Disciples of Christ); The Methodist Church; the Presbyterian Church in the U.S.; the Protestant Episcopal Church in the U.S.A.; the Roman Catholic Church; the Southern Baptist Convention; and the United Presbyterian Church in the U.S.A.

KENTUCKY SIGHTS

These vats in Mammoth Cave (*top left*) were used in the mining of saltpeter for explosives in the War of 1812 (*courtesy Kentucky Dept. of Public Relations, Frankfort*). Horses graze (*above*) in the bluegrass region (*courtesy Caufield & Shook, Louisville*). A reminder of bygone days (*below*) along the Kentucky River (*courtesy L & N Employes' Magazine, Louisville*)

Chief Cities: Louisville, the largest city, on the Ohio River in northern Kentucky, is a port and rail terminal; its industries include distilling, meat-packing, and aluminum fabrication.

Lexington, the second-largest city, in central



HISTORIC LANDMARKS

A historical park at Hodgenville (*above*) encloses the log cabin believed to be Abraham Lincoln's birthplace. Pioneer Memorial State Park (*top right*) in Harrodsburg, shows a replica of Ft. Harrod; it commemorates Kentucky's first permanent white settlement. Lincoln's parents were married nearby

KENTUCKY'S FINEST PRODUCTS

The state is famous for its whiskies, especially bourbon; many towns produce their own distinctive brand at distilleries like this one (*center right*) at Frankfort. The bluegrass country specializes in raising thoroughbred race horses, and each May spectators flock to Churchill Downs to see the classic Kentucky Derby (*above*). The state is also noted for its high-quality tobacco (*right*) one of its important money crops (*courtesy Kentucky Dept. of Public Relations*)

Courtesy Div. of Publicity, Frankfort, Ky.

CUMBERLAND FALLS STATE PARK

DuPont Lodge (*above*) and unspoiled natural beauty draw many visitors to this Kentucky park

Kentucky, is the seat of the state university and the market place for an agricultural area, particularly for its thoroughbred horses.

Covington, the third-largest city, at the confluence of the Licking and Ohio rivers, is a major center for marketing and manufacturing.

Frankfort, the state capital, on the Kentucky River in north central Kentucky, is also important for distilling and marketing.

Paducah, on the Ohio River at the junction of the Tennessee, is a river port; it has shipyards and an extensive trade in tobacco, lumber, and flour.

Famous Men and Women: Barkley, Alben William (1877-1956), U.S. Senator (1927-49; 1955-56) and Vice President of the U.S. (1949-53).

Boone, Daniel (1734-1820), frontiersman who founded Boonesborough (1775), one of the first settlements west of the Alleghenies.

Brandeis, Louis Dembitz (1856-1941), Associate Justice of the U.S. Supreme Court (1916-39).

Breckinridge, John Cabell (1821-75), Vice President of the U.S. (1857-61); Confederate Secretary of War (1865).

Carson, Christopher ("Kit"), (1809-68), frontiersman, scout, and army officer.

Clay, Henry (1777-1852), statesman who, with Daniel Webster, produced the Compromise of 1850 to try to forestall the Civil War.

Cobb, Irvin S. (1876-1944), novelist and short-story writer.

Davis, Jefferson (1808-89), President of the Confederacy (1861-65).

Johnson, Richard M. (1780-1850), Vice President of the U.S. (1837-41).

Lincoln, Abraham (1809-65), 16th President of the U.S. (1861-65).

Morgan, John Hunt (1825-64), Confederate general, leader of Morgan's Raiders, a cavalry unit.

Courtesy Louisville Chamber of Commerce

UNIVERSITY OF LOUISVILLE, KENTUCKY

The main campus of the municipal university is centrally located, close to the city's main business district

Rice, Alice (1870-1942), author of children's books, including "Mrs. Wiggs of the Cabbage Patch."

Roberts, Elizabeth Madox (1886-1941), novelist and poet.

Education

Education is free and compulsory for children between the ages of seven and 16. The state's public-school system was established in 1849. Public-school enrollment in 1962 totaled 647,203, and the enrollment in Roman Catholic parochial schools in that year was 76,820. The leading state-supported institutions of higher learning include the Univ. of Kentucky, Lexington, with educational centers at four other locations in the state; Kentucky State Coll., Frankfort; Eastern Kentucky State Coll., Richmond; Western Kentucky State Coll., Bowling Green; Murray State Coll., Murray; and Morehead State Coll., Morehead. Leading private and denominational institutions of higher learning include Asbury Coll., Wilmore; Bellarmine Coll. and Nazareth Coll., both in Louisville; Berea Coll., Berea; Centre Coll., Danville; Georgetown Coll., Georgetown; Kentucky Wesleyan Coll., Owensboro; Transylvania Coll., Lexington; Union Coll., Barbourville; and the Univ. of Louisville, Louisville.

Cultural institutions include the Audubon Memorial, near Henderson, a museum of relics connected with the life of John J. Audubon, naturalist and painter who did much of his work in Kentucky; Pioneer Memorial, a park containing a museum with exhibits of frontier life and the cabin in which Lincoln's parents were married; and the Patton Museum, Ft. Knox, with a collection of World War II weapons and equipment, founded by Gen. George S. Patton. The Kentucky Historical Society, Frankfort, and the Filson Club, Louisville, are leading historical museums and libraries.

Government

Kentucky is governed under the provisions of the constitution of 1891. Executive authority is given to a governor, lieutenant governor, treasurer, auditor, attorney general, superintendent of public instruction, and commissioners of agriculture, labor, and statistics, all elected for four-year terms. The legislature consists of a senate of 38 members, elected to four-year terms, and a house of representatives of 100 members, elected every two years. The highest court is the court of appeals; it has seven elected justices, assisted by four commissioners, all serving terms of eight years. The judicial system also includes circuit courts, quarterly courts, county courts, fiscal courts, local courts, and police courts.

The state of Kentucky is represented in the U.S. Congress by two Senators and seven Representatives.

History

"The Dark and Bloody Ground" was the name by which the Indians referred to Kentucky. The land, a thickly forested wilderness,

Courtesy Dept. of Public Relations, Frankfort, Ky.

DANIEL BOONE MEMORIAL

In Frankfort Cemetery, on the Kentucky River

Courtesy Dept. of Public Relations, Frankfort, Ky.

JEFFERSON DAVIS MONUMENT

A 351-ft. obelisk at Fairview

was not inhabited to any extent by the Indians but was an important hunting preserve. Its ownership was long disputed among the Shawnee, Mingo, and Delaware, and they tried to withhold it from the white man. Probably the first white man to see Kentucky was Robert Cavelier, Sieur de La Salle, on his expedition of 1669. Dr. Thomas Walker, in 1750, ventured through the Cumberland Gap to explore the eastern part of the present state. In the years that followed, John Finley, Daniel Boone, and other hunters made occasional trips into Kentucky. In 1773 Boone made an unsuccessful attempt to establish a colony, losing his son in an Indian raid. Returning in 1775, he built a stockade and village called Boonesborough. A year earlier, James Harrod had founded a settlement called Harrodsburg.

During the Revolutionary War, these frontier posts survived only by the most heroic defense, as the British encouraged the Indians to rise against them. Boonesborough withstood a siege that was a milestone in this kind of warfare. The last battle of the Revolution was fought in Kentucky at Blue Lick Springs (1782), when the settlers were defeated by the Indians. During this period, there was also continuing conflict between the residents of Kentucky and the government of Virginia. Virginia claimed Kentucky as part of the charter grant of 1584. After

MAJOR RECREATIONAL AND HISTORIC FEATURES

Name and Type	*Size and Location*	*Points of Interest*
Mammoth Cave National Park (established 1941)	51,354 acres near Cave City (U.S. 31W; state 70)	More than 150 m. of underground passages and chambers; river 360 ft. below ground
Abraham Lincoln National Historical Park (established 1916)	116 acres near Hodgenville (U.S. 31E; state 61)	Birthplace cabin of Abraham Lincoln
Cumberland Gap National Historical Park (established 1959)	20,193 acres near Middlesboro, the remainder in Tennessee and Virginia (U.S. 25E, 119, 421)	Mountain pass of the Wilderness Road, explored by Daniel Boone
Cumberland National Forest (established 1937)	459,915 acres near Whitley City (U.S. 25, 27, 60; state 11, 30, 52, 89)	Wooded slopes of Cumberland Mts.; Red River Gorge; natural bridge, caves and springs; Cumberland Falls and Natural Bridge state parks nearby
Butler Memorial State Park (established 1929)	421 acres near Carrollton (U.S. 42; state 35, 36, 47)	Home of William Butler, U.S. commander in the Mexican War; fine view of the Ohio River
Cumberland Falls State Park (established 1931)	1,098 acres near Corbin (U.S. 25W, 27; state 90)	Waterfall with rare "moonbow" (night rainbow)
Pioneer Memorial State Park (established 1925)	28 acres in Harrodsburg (U.S. 68; state 35)	Replica of Ft. Harrod, typical frontier fort and cabins

"MY OLD KENTUCKY HOME"

This beautifully preserved plantation home, near Bardstown, was the inspiration for the famous song by Stephen C. Foster (1826-64) which has been adopted as Kentucky's official state song

a long series of petitions, conventions, delegations to Virginia, and acts of the Virginia legislature, the U.S. Congress settled the matter by making Kentucky a state, the first beyond the Alleghenies, on June 1, 1792.

During the War of 1812, Kentuckians were eager to join the fight. Henry Clay, a Kentucky Congressman, was one of those called the "War Hawks" because of their repeated demands for war with Great Britain. Kentucky riflemen stood with Andrew Jackson at the battle of New Orleans in 1815. It was largely due to Clay's diplomacy that a favorable settlement of the war was made in the treaty of Ghent.

When the frontier had been conquered, Kentucky settled down to a plantation economy based on tobacco and slavery. Steamers began to ply the Mississippi and Ohio rivers, railroads were built, and Kentucky prospered. The Civil War found the state divided in sentiment. Unable to remain neutral or to escape the conflict, Kentucky did not secede from the Union, but Kentuckians joined both sides of the struggle. Confederate and Union forces invaded the state, fighting the battles of Mill Springs, Richmond, and Perryville. Union troops gained control in 1862, holding the state from then until the end of the war.

After the Civil War, Kentucky was spared the turmoil of Reconstruction, since it did not need to seek readmission to the Union, but many adjustments had to be made when slavery was abolished.

Large-scale production of coal began in the 1870's, and the steel industry began to develop at Ashland. During World War I, many recruits were trained at Camp Knox, later renamed Ft. Knox. Kentucky supplied 94,516 residents to the U.S. armed forces in that war. In 1936 the Federal government chose Ft. Knox as repository for the supply of gold that backs the nation's currency. During World War II, 326,798 men and women from Kentucky served in the armed forces, and Ft. Knox became an important base for the training of tank crews and mechanized divisions. The postwar years have seen significant changes in Kentucky. The state's agriculture has achieved a broader base, as farmers have begun to reduce their former heavy reliance on tobacco raising. The state's war-born industries have successfully converted to peacetime production and are expanding rapidly.

See also separate entries on most of the persons and geographical subjects mentioned.

Kentucky, UNIVERSITY OF, a coeducational, land-grant, state institution of higher learning at Lexington, Ky., founded in 1865. There are colleges of agriculture and home economics, arts and sciences, commerce, dentistry, education, engineering, law, medicine, nursing, and pharmacy, a graduate school, and a division of extended programs. The library has more than 800,000 volumes. The annual student enrollment totals *ca.* 10,000, and there are some 900 members of the faculty. The physical plant is valued at more than $60,000,000.

Kentucky Resolutions, a series of resolutions drafted by Thomas Jefferson (*q.v.*), adopted in 1798 by the Kentucky legislature, and directed against the misuse of powers by the Federal government over the states. The resolutions were provoked by the passage of the Alien and Sedition Laws (*q.v.*). The resolutions declared the passage of these acts unconstitutional and that in enacting them the Federal government had gone beyond its powers. In 1799 another resolution was passed asserting the right of the states to nullify any law passed by the Federal government that they judged unconstitutional, rather than leaving it to the U.S. Supreme Court to declare a law unconstitutional. The Virginia Resolutions, drafted by James Madison (*q.v.*) and passed by the Virginia legislature in 1798, were similar in sentiment but not as strongly worded as the Kentucky Resolutions. The resolutions were important as an attack on the Federalist party, which was then in power, and as early statements supporting the states' rights theory of government. See also *Nullification; States' Rights.*

Kenya Colony and Protectorate (*kē'nyä*), a British colony and protectorate in East Africa, bounded by the Indian Ocean, Somalia, Ethiopia, the Sudan, Uganda, and Tanganyika. The protectorate alone consists of the mainland possessions of the sultan of Zanzibar, comprising a 10-m.-wide coastal strip between the Tana River and the Tanganyika border and including offshore islands. The area of Kenya is 224,960 sq. m.

Kenya has six provinces: Coast (capital, Mombasa), Central (capital, Nyeri), Rift Valley (capital, Nakuru), Nyanza (capital, Kisumu), Northern (capital, Isiolo), and Southern (capital, Ngong); and one extra-provincial district, Nairobi.

Nairobi, the capital of Kenya, has a population of *ca.* 297,000; Mombasa, with *ca.* 189,000, is the second-largest town. Mombasa, on an island of the same name, is the terminus of the Kenya and Uganda Ry. Kilindini harbor on the island is the finest sheltered harbor on the East African coast.

Dairy and wool products are important, and a large quantity of butter, meat, and hides is exported yearly. Gold, silver, copper, and other minerals are mined. About one-third of the foreign trade is carried on with Great Britain. Imports amounted to *ca.* $250,000,000 in a recent year, and exports to *ca.* $120,000,000.

Of the 7,290,000 estimated population in 1961, 178,000 were Asiatics, 66,000 Europeans, and 39,000 Arabs. Arabs and Swahilis predominate along the coast. Inland are the Bantu-speaking tribes. There are also Kavirondo, Nandi, Lumbwa, Masai, Somali, and Galla peoples.

Religion is predominantly pagan, although the influence of Christianity is strong and many persons along the coast are Moslem. There are Protestant and Roman Catholic missions. The educational system includes *ca.* 4,750 government-maintained or aided elementary and secondary schools (*ca.* 4,500 for Africans), and 540 non-government schools (500 for Africans). About half of the schools are managed by Protestant churches and about one-third by the Roman Catholic Church. The interracial Royal Coll., in Nairobi, is one of the colleges of the projected Univ. of East Africa; the Kenya Polytechnic and Technical Inst., which is also in Nairobi, was opened in 1961.

Since 1960 Kenya has been administered by a governor, advised by a council of ministers. There is a legislative council, with 53 members (33 Africans, 10 Europeans, 8 Asians, and 2 Arabs) elected by the constituency, 12 national members (4 Africans, 4 Europeans, 3 Asians, and 1 Arab) elected by the council sitting as an electoral college, and a varying number of members appointed by the governor. The council of state, which protects any community against harmful discriminatory legislation, consists of a chairman and from 10 to 16 members.

Before the European partition of Africa, the sultan of Zanzibar controlled much of the East African coast. British influence in Kenya first dates from 1877. From 1885 to 1890 the sultanate of Witu in Tanaland Province was under German protection, but an Anglo-German agreement in 1890 transferred Witu to England and settled the boundaries of British and German East Africa. In 1887 the sultan of Zanzibar conceded the administration of his mainland territories to a British company headed by Sir William Mackinnon, which received a royal charter (1888) as the

KENYA COLONY

Tribesmen drink the blood of a steer slain for butchering

Courtesy Ewing Galloway, N. Y.

Imperial British East Africa Company. In 1895 the company's territory was transferred to the Crown. In 1920 Kenya became a crown colony. On June 29, 1925, Great Britain ceded to Italy a strip of territory 50 to 100 m. wide on the western side of the Juba River.

In World War I, the German East African forces under von Lettow-Vorbeck invaded Kenya in 1914, but were hurled back across the frontier in the following year. When World War II broke out in 1939, Kenya forces met and delayed the Italians at Moyale on the arid northeastern frontier, and took part in the retreat to Berbera, British Somaliland, in August 1940.

Keokuk (*kē'ō-kŭk*), a city in southeastern Iowa, seat of Lee County, at the confluence of the Des Moines and Mississippi rivers, 177 m. N. of St. Louis, Mo. It is served by four railroads, including the Toledo, Peoria & Western R.R. and the Burlington Route. Keokuk is surrounded by a prosperous agricultural region, and is the center of many diversified industries. Manufactures of the city include steel castings, rubber products, fiber boxes, iron alloys, and corn products. Its value added by manufacture was $26,530,000 in 1958. Keokuk Dam, 53 ft. high and with a span of nearly a mile, is located here. The site of what is now the city was settled in 1820, and was named after the Indian chief Keokuk. It was incorporated as a city in 1847.

Population, 1940, 15,076; in 1950, 16,144; in 1960, 16,316.

Kepler (*kĕp'lĕr*), JOHANN, eminent astronomer, born at Weilderstadt, in Württemberg, Germany, Dec. 27, 1571; died in Ratisbon, Nov. 15, 1630. He was left to his own resources when a child, and his early education was neglected, but later he studied at Maulbronn and graduated from the Univ. of Tübingen. In 1593 he was chosen a teacher of mathematics at Gratz, in Styria. During his residence at that city he devoted himself to the study of astronomy, but when the religious persecution began, in 1599, he accepted an election to Prague tendered by Tycho Brahe. There he assisted in the preparation of astronomical charts and tables, and, after the death of Tycho, continued this work by himself, and received an appointment under Ferdinand II as imperial mathematician and astronomer. Later he accepted an appointment at Ratisbon, and there, as elsewhere, he suffered the pangs of poverty, owing to an inadequate salary. In 1602 he published "Principles of Astronomy." The work of Kepler is of vast importance. Although Copernicus had established the theory of the motion of the planets, it was still held that heavenly bodies moved without unity and fixed natural laws, but it was generally thought that the sun is the common center of all.

The three great laws of Kepler were announced after the study of a quarter of a century, and form the basic beginning of modern astronomy. These are: 1. The planets move in ellipses with the sun at one focus. 2. The radius vector of each planet sweeps over equal areas in equal times. 3. The squares of the times of the revolution of the planets are proportional to the cubes of their distance from the sun. Besides these, he announced the law of diminution of light in proportion to the inverse square of the distance, the decrease in the attractive force of the sun with distance, and many valuable discoveries in geometry and physics. His most important publication is "The New Astronomy, or The Celestial Physics Delivered in Commentaries on the Motion of Mars." Many of the theories of Kepler were not accepted until long after his death, and some of his books were prohibited by the Inquisition. In speaking of his "Harmonies of the World," he said: "It may well wait a century for a reader, as God has waited 6,000 years for an observer."

JOHANN KEPLER

Ker (*kĕr*), or KERR, a noble Anglo-Norman family which settled in Roxburghshire, on the border of Scotland, at the end of the 12th century. The families of Cessford and Ferniehirst derive from the Kers. The latter branch bore Robert Carr, Earl of Somerset (d., 1645), a favorite of James I. The family in all its branches has been intimately associated with Scottish and English affairs of state from its earliest days. The chief male representative of the line today is George Victor Robert John Innes-Ker, the 9th Duke of Roxburghe.

Keratitis (*kĕr-ȧ-tī'tĭs*), in medicine, inflam-

mation of the cornea, the anterior part of the eyeball which is normally transparent. This inflammation causes the cornea to become opaque.

Kerch (*kĕrch*), a peninsula in eastern Crimea, 70 m. long and 20 to 30 m. wide, which lies between the Sea of Azov and the Black Sea; also, a city located at the eastern end of the peninsula on Kerch or Yenikale Strait. The city is an important railroad terminus and seaport, with mining and metallurgical industries. It was founded (*ca.* 600 B.C.) as Panticapaeum by Greek colonists and is noted for its archaeologically interesting antiquities. In the 14th and 15th centuries, it was a colony of Genoa and was captured (1475) by the Turks. Passing to Russia in 1771, the city was sacked by the English in the Crimean War. In World War II, Kerch was twice occupied by the Germans (1941, 1942-44), suffering heavy damage. Population, 1945, 104,471.

Kerensky (*kē-rĕn′skĭ*), ALEXANDER, Russian Socialist leader, born in Simbirsk, Russia, in 1881. He studied at the Univ. of St. Petersburg (now Leningrad) and became a lawyer, gaining a reputation for defending political offenders. Joining the Labor party, he sat in the last Duma as a moderate Socialist. In 1917, after the first revolution, he became minister of justice and, later, premier. In the latter capacity, he proclaimed Russia a republic on Sept. 15. During October, however, the power of the Bolshevists (*q.v.*) increased, and on Nov. 8 Lenin and Trotsky (*qq.v.*) seized power. After an unsuccessful attempt to restore his government, Kerensky escaped from Russia, going ultimately to Paris, France, where he edited a Socialist newspaper. He settled in the U.S. in 1940. His books include "The Prelude to Bolshevism" (1919) and "Crucifixion of Liberty" (1934). See also *Russia.*

Kern (*kĕrn*), JEROME DAVID, composer, born in New York City, Jan. 27, 1885; died there, Nov. 11, 1945. He studied music in New York and Germany and became a composer of popular light operas. Melodies from the scores of "Have a Heart" (1917), "Sally" (1920), "Sunny" (1925), "Show Boat" (1929), "Sweet Adeline" (1929), "The Cat and the Fiddle" (1931), "Roberta" (1933), "Swing Time" (1936), "Very Warm for May" (1939) and other Kern works are perennial favorites. He died just after preparing a Broadway revival of "Show Boat."

Kerosene (*kĕr′ō-sēn*) or KEROSINE, a light oil used mainly for illumination and heating. Formerly distilled from shales and bituminous coal, it was also called *coal oil;* it is now produced principally by the distillation of petroleum. It has a slightly yellowish color, a disagreeable odor, and the property of burning with a bright flame. The U.S. produces almost half of the world's kerosene.

Kerr (*kär*), PHILIP HENRY, 11TH MARQUIS OF LOTHIAN, statesman, born in London, England, April 18, 1882; died in Washington, D.C., Dec. 12, 1940. Lord Lothian was educated at Oxford Univ. and subsequently went to Africa, where he was assistant secretary of the intercolonial council of the Transvaal and Orange River Colony (1905-08) and held various official positions in South Africa (1905-16). Returning to England, he was secretary to Prime Minister Lloyd George (1916-21), secretary of the Rhodes Trust (1925-39), and Parliamentary undersecretary in the India office (1931-32). In 1939, during one of Britain's worst crises, he was appointed British ambassador to the U.S.

Kesselring (*kĕs′ĕl-rĭng*), ALBERT, field marshal, born in Franconia, Germany, Nov. 30, 1885; died in Bad Nauheim, July 16, 1960. He served in the air force during World War I with Hermann Göring (*q.v.*) who later helped his advancement. Under the Nazi regime, he became chief of the general staff of the *Luftwaffe* (1936) and later general field marshal (June 1940). Kesselring commanded all the most important air offensives of World War II; he directed the *Luftwaffe* in the invasion of France (1940) and commanded the air forces which attacked England, 1940-41. In 1941 he was in command of the air forces on the central Russian front and later acted as chief of German air forces in Italy. In March 1945 he replaced Karl von Rundstedt (*q.v.*) as commander on the western front. After the surrender of Germany, he was convicted of war crimes against Italian citizens and imprisoned for life; however, he was released in 1952 because of ill health.

JEROME KERN

Kestrel (*kĕs'trĕl*) or WINDHOVER, a species of falcon native to Europe and Africa. It is about 1 ft. in length and in color and habits closely resembles the sparrow hawk of America. The kestrel hovers in search of prey at a height of about 40 ft. and pounces suddenly upon small birds, mice, and reptiles, hence the name *windhover*. Young kestrels may be trained to pursue small birds, such as larks, quail, and snipe. The plumage is of a variety of colors, usually light grayish-blue in the male and somewhat reddish in the female.

Ketchikan (*kĕch'ĭ-kăn'*), a town in Alaska, on the southwest coast of Revillagigedo Island, 235 m. S.E. of Juneau. The leading seaport of Alaska, it is a processing center for the region's fishing, gold-mining, and lumbering industries. As the first Alaskan port of call from the U.S., the town attracts many tourists. Ketchikan served as a supply point during the gold rush of the 1890's. Population, 1950, 5,305.

Kettering (*kĕt'ĕr-ĭng*), CHARLES FRANKLIN, electrical engineer, inventor, and manufacturer, born near Loudonville, Ohio, Aug. 29, 1876; died in Dayton, Ohio, Nov. 25, 1958. Graduated from Ohio State Univ. in 1904, he first worked (1904-09) for the National Cash Register Co., where he invented the electric motor for cash registers. In 1909 he formed the Dayton Engineering Laboratories (later called Delco). The firm was purchased by United Motors Corp. (later called General Motors Corp.). From 1917 to his retirement in 1947, Kettering was vice president of the parent company and president of a subsidiary, the General Motors Research Corp. Among his 140 patented inventions are the electric ignition system and the self-starter for automobiles and a gasoline-motor electric system for farms. He founded the Charles F. Kettering Foundation for scientific research and, with Alfred P. Sloan, the Sloan-Kettering Inst. for Cancer Research.

Kettledrum (*kĕt'l-drŭm*), a percussion instrument. The drum consists of a hemispheric copper or brass cauldron, closed with a skin and placed on a low tripod in front of the player. Usually employed in pairs or threes (called collectively the timpani, from the Italian), the drums are struck with soft-headed sticks. The tension of the skin is adjusted to exact pitch by a number of screws arranged along the drum's rim. These screws are turned individually, although machine drums have been built which control the pitch with a central screw or pedal. Large kettledrums originated in the Middle East and reached Western Europe via Poland and Hungary in the 15th century. The drums were used at first in royal retinues, as they had been in the East, and they later passed into cavalry use. Centuries later they found a place in orchestras outside the courts; nevertheless, Handel, in performing his oratorios, was still forced to borrow drums from the royal stores. Not before 1750 was the timpanist a steady member of the orchestra. It took even longer to widen the timpani repertoire from mere fortissimo accents, played with the trumpets, to subtler color effects in orchestration. The traditional number of two drums was not increased until the 19th century; Berlioz, however, orchestrated his *"Requiem"* for no less than 16 drums.

Ketuba (*kĕt'ōo-bä*), the Hebrew term for the written marriage contract made in accordance with Jewish law. The name is derived from the Hebrew word for "writing." It is primarily an agreement on the part of the groom concerning his duties under the law; it covers the dowry arrangements and the marriage settlement. Signed by the groom and two witnesses, it is read during the wedding ceremony. Some of these documents, written on parchment, are works of art.

Kew (*kū*), a civil parish of Richmond municipal borough, on the south bank of the Thames River in Surrey, England, about 15 m. from the center of London. Kew is noted for the Royal Botanical Gardens and Arboretum, which originated in gardens designed about the middle of the 17th century by Henry Capel, Baron Capel of Tewkesbury. They were enlarged by George III and have been open to the public since 1840, when they were presented to the nation by Queen Victoria. The total area of the gardens is about 288 acres.

Kewanee (*kē-wŏn'ē*), a city in Henry County, Illinois, 50 m. N.W. of Peoria. Kewanee is served by the Chicago, Burlington & Quincy R.R. and is in a coal-producing and farming area. Manufactures include boilers, pumps, farm machinery, tools, gloves, and food products. The place was settled as Wethersfield in 1836 and was chartered under its present name in 1897. Population, 1930, 17,093; 1940, 16,901; 1950, 16,821.

Key (*kē*), FRANCIS SCOTT, lawyer and poet, born in Frederick County, Md., Aug. 1, 1779; died in Baltimore, Md., Jan. 11, 1843. He attended (1789-96) St. John's Coll., Annapolis, studied law, and set up (1801) a practice in Frederick, Md. Later he served (1833-41) as district attorney for Washington, D.C. On the night of Sept. 13-14, 1814, while negotiating for the release of an American prisoner of war, Key was himself detained on a British warship. All night he watched the British bombardment of Ft. McHenry, Baltimore, and in the morning, when he saw the American flag still flying over the fort, he wrote the poem "The Star-Spangled Banner" (*q.v.*) on the back of an envelope. It was later set to the tune of "Anacreon in Heaven." In 1931 the song was officially adopted as the national anthem of the U.S. James Lick, of California, gave

Courtesy Brown Bros., N. Y

FRANCIS SCOTT KEY

Courtesy British Information Services, N. Y.

JOHN MAYNARD KEYNES

$60,000 to build a monument for Key, which was erected in 1887 in the Golden Gate Park, San Francisco.

Keyes (*kēz*), ERASMUS DARWIN, soldier, born at Brimfield, Mass., May 29, 1810; died Oct. 14, 1895. He was graduated from the U.S. Military Acad. in 1832, served on the frontier against the Indians and during the Civil War, and subsequently became interested in gold mining in California. During the Civil War he fought in the first Battle of Bull Run and later commanded in the Army of the Potomac, under Gen. McClellan. In 1863 he took part in the expedition against Richmond. The following year he resigned from the service, having attained to the rank of brigadier general. He published "Fifty Years' Observation of Men and Events."

Keyes, FRANCES PARKINSON, writer, born Frances Parkinson Wheeler in Charlottesville, Va., July 21, 1885. Educated at private schools in Boston, Berlin, and Switzerland, she has always been a traveler, having made many trips to Europe and one, in 1931, to Persia. Her first novel, "The Old Gray Homestead," was published in 1921, and since that time she has devoted herself to writing novels and magazine articles. Among her many popular novels are: "The Career of David Noble" (1921), "Queen Anne's Lace" (1930), "Senator Marlowe's Daughter" (1933), "The Great Tradition" (1939), "Crescent Carnival" (1942), "Also the Hills" (1943), and "The River Road" (1945).

Keynes (*kānz*), JOHN MAYNARD, LORD, economist, born in Cambridge, England, 1872; died Apr. 21, 1946. The author of numerous books on various economic problems, he entered into the field of writing as editor of the *Economic Journal* in 1912. He served on the Royal Commission on Indian Finance and Currency (1913-14) and later in the British Treasury, acting as its principal representative at the Paris Peace Conference in 1919. He also was a deputy on the Supreme Economic Council, a member of the Committee on Finance, and secretary of the Royal Economic Society. His first book, "Indian Currency and Finance," was published a year later. He became famous when he published his "The Economic Consequences of the Peace" (1920), which was the first book asserting what was later generally accepted to be true, namely, that the economic program of the Versailles Treaty was unworkable. Keynes was the author of a number of other books, many of which were the subject of much discussion and writing. As an economist, he was best known for his emphasis upon controlled currency and the use of deficit spending to bring capitalist economies from depression to prosperity. His theories are generally believed to have underlaid the economic policies of the New Deal.

Well known to American financiers, Lord Keynes frequently visited this country. His last two visits were undertaken in connection with Anglo-American loan negotiations (1945) and as British representative to the International Monetary Conference at Savannah, Ga. (1946).

Keys (*kēz*), POWER OF THE, a term designating the power of the Catholic Church in judging human beings. This jurisdiction is, according to Church doctrine, incorporated in the Pope, the supreme pontiff, who leads the Church by inheriting the authority of St. Peter, the first bishop of Rome. From this authority derives the title to grant absolution or to withhold it, and thus it was indirectly given to the ordained Roman Catholic priest. The allegory refers to the power of the man who possesses the keys of a house, and therefore has authority over all its tenants—an analogy used by Christ in giving this power to St. Peter.

Keyserling (*kī'zēr-ling*), COUNT HERMANN,

philosopher and author, born in Russian Livonia (now Estonia), July 29, 1880; died in Innsbruck, Austria, April 26, 1946. He was educated at the universities of Geneva, Tartu, Heidelberg, and Vienna. A trip around the world resulted in his best-known book, "The Travel Diary of a Philosopher" (1925). In 1920 he founded a philosophical center at Darmstadt, Germany, called the "School of Wisdom," which tried to combine the most valuable elements of Eastern and Western thought. His other books include "America Set Free" (1929) and "From Suffering to Fulfilment" (1938).

Key West, county seat of Monroe County and an island in southwestern Florida, *ca.* 60 m. s.w. of Cape Sable at Florida's southern tip. The southernmost city in the U.S., Key West is connected with the mainland by the 123-m. Overseas Highway. The popular tourist resort has sponge and turtle fisheries, fish canneries, and cigar factories. Points of interest include the lighthouse built in 1846, the sponge pier, the aquarium, and two Civil War forts. Key West was settled in 1822 and by 1830 had the greatest per capita wealth of any American city, due to its salvage operations. But the building of lighthouses in the 1840's decreased shipwrecks on the reefs, and the income dropped until the city was bankrupt in 1934. The Federal government, which maintains a naval base and Coast Guard installations here, aided its return to prosperity. Key West, many of whose permanent inhabitants are of Cuban, Spanish, English, and Negro descent, was incorporated in 1834. Population, 1950, 26,433.

Khachaturian (*kăch-ą-tōō'ri-ąn*), ARAM ILICH, composer, born in Tiflis, Russia, June 6, 1904(?), of Armenian parents. He graduated (1934) from the Moscow Conservatory. His works include two symphonies (1934, 1943); a piano concerto (1935); a violin concerto (1940); "Masquerade," an orchestral suite (1944); and a cello concerto. The composition by which he is best known in the U.S. is the "Sabre Dance" from his "Gayne" ballet (1942). Khachaturian's music, much of it inspired by Russian and Armenian folk themes, is characterized by its exuberant tempos and striking dissonances.

Kharkov (*kär'kŏv*), an oblast (region) of the U.S.S.R., in northeastern Ukrainian S.S.R., with an area of *ca.* 12,000 sq. m. Agricultural products include wheat, sugar beets, and sunflowers. The capital, Kharkov, about 400 m. s. of Moscow, is among the five largest cities in the U.S.S.R. and is a leading railroad and industrial center of the Soviet Union. It has manufactures of tractors, turbines, ball bearings, rolling stock, machinery, mining equipment, and foodstuffs. Kharkov was founded by the Cossacks in 1654 and became the administrative center of the Ukraine in 1765. From 1919 to 1934 it was the capital of the Ukrainian S.S.R. In World War I it was seized by the Germans (April 1918), and it suffered considerable damage in the civil war period until 1920. In World War II it was held by the Germans from October 1941 until August 1943 and sustained heavy damage. Population of the oblast, 1939, 2,935,000; of the city, 1939, 833,432.

Khartoum (*kär-tōōm'*) or KHARTUM, a city in northeastern Africa, capital of Sudan and of Khartoum province. Situated at the junction of the White Nile and Blue Nile rivers, it is an important river port and the commercial center of the region; it has rail connections with Cairo and Port Sudan. It is the seat of the Univ. Coll. of Khartoum (founded 1902). Khartoum was founded in 1823 by Mehemet Ali (*q.v.*). It was held through a long siege (1884-85) by the British under Gen. Charles Gordon (*q.v.*), but the troops of the Mahdi (*q.v.*) entered the city on Jan. 26, 1885, destroyed most of the city, and killed Gordon. Lord Kitchener (*q.v.*) recaptured Khartoum on Sept. 4, 1898. Population, 1953, 82,700.

Khazars (*kä-zärz'*) or CHAZARS, a nomadic Turkic people who first migrated from Asia to eastern Russia in the 2nd century A.D. In the 5th century they were conquered by the Huns, but re-emerged in the 6th and 7th centuries and established a kingdom which at its height extended west to the Dnieper River and south to the Caucasus and the Crimea. The king and nobility of the Khazars adopted Judaism as the state religion *ca.* 740, and many Russian Jews are believed to be descended from the Khazars. The kingdom was conquered in the 10th century by Sviatoslav, prince of Kiev, and most of the Khazars were killed in the course of the next century.

Khiva (*kē'vą*), a former khanate (realm of a khan, a Tatar prince) in southwestern Asia, south of Lake Aral in the valley of the lower Amu Darya. It now forms part of the Uzbek S.S.R., with an area of about 22,000 sq. m. The khanate arose in the 16th century and retained its independence, despite Russian attacks in 1717 and 1839, until 1873, when it was finally conquered by the Russians. From then until the Russian Revolution the khans continued to rule Khiva as Russian vassals. The former capital city, Khiva, has important textile industries and is a terminus for caravans crossing the Kara Kum (desert). The older part of the city contains many architectural monuments of the past, including the khan's palace and gardens, Moslem schools, mosques, minarets, and bazaars. Population of the city, *ca.* 20,000.

Khorsabad (*kôr'sä-băd*), a village in Iraq, 12 m. N.E. of Mosul, near the site of the ancient city of Nineveh. At Khorsabad were un-

covered the remains of the capital of Sargon II of Assyria, Dur Sharrukin, established about 710 B.C. In 1843-52 the royal palace, with its bas reliefs, and the city gates, with their massive winged bull statues, were discovered by French archaeologists. Many of the unearthed objects were placed in the Louvre, at Paris.

Khosru (*kŏs'rōō*), the name of two Persian monarchs, the second, who died in 628, being the grandson of the first, who died in 579. The intervening ruler was Hormazd (or Hornisdas) IV, son of Khosru I. After waging war with the Byzantine emperor, Justinian, and with Justin II, Khosru I was defeated at Melitene, Armenia, in 571. Khosru II succeeded to the throne when his father was deposed in 590 by a rebel general. Within a few years, Khosru II had conquered Syria, Egypt, and Asia Minor. Following the loss of these possessions to Heraclius, he was deposed and murdered by his son, Kavadh II.

Khrushchev (*krōō'shchĕv*), NIKITA S., Communist official, born in Kalinovka, Russia, April 17, 1894. The son of a coal miner, in his youth he worked in the mines. He joined the Bolshevik revolution in 1918, and after 1921 he directed party work in the Ukraine. In 1935 he was responsible for the building of the Moscow subway and the industrialization program of the second Five-Year Plan. In 1939 he was made a full member of the Politburo and a member of the presidium of the U.S.S.R. Supreme Soviet. During World War II he directed the Ukrainian guerrilla forces, and after the war he directed the reconstruction of the economy of that region. On Sept. 13, 1953, he became First Secretary of the Central Committee of the Communist party. From that date he gradually rose to power, and at the 20th Communist party congress (1956), he denounced the rule of the late Stalin (*q.v.*). For a brief period in 1957 his position was threatened, but his leadership was reaffirmed by the Central Committee, and he was able to eliminate such rivals as Malenkov, Molotov, and Zhukov (*qq.v.*). On March 27, 1958, he replaced N. A. Bulganin (*q.v.*) as premier and at the same time retained his post as First Secretary of the party, thereby gaining supreme power in the U.S.S.R.

Khufu (*kōō'fōō*). See *Cheops.*

Khyber Pass (*kī'bĕr*), a mountain pass on the border between West Pakistan and eastern Afghanistan and a strategic point on the route from Peshawar to Kabul. The pass is about 33 m. long and from 50 to 450 ft. wide. Steep, rocky cliffs rising up to 1,000 ft. and mountains rising up to 3,000 ft. lie on either side. Used as a highway by traders and by armies invading India from Afghanistan, the pass has often figured in military history. Alexander the Great utilized it, and it was important in the 19th-century Afghan Wars fought by the British.

Kiangsi (*jĭ-äng'sē*), a province of the South China highlands, watered by a tributary of the Yangtze River and characterized by fertile valleys and mountain ranges. A fertile lowland lies about the Po-yang Lake, of which the central point is Nanchang, the capital. The principal crop is rice; other products are tea and tobacco. Area, 77,281 sq. m.; population, 1953, 16,772,865.

Kiangsu (*jyäng'sōō'*), a province in eastern China, bordering on the Yellow Sea, the world's most densely populated area. The Yangtze River crosses the southern part of Kiangsu; the Grand Canal traverses it from north to south, providing irrigation and transportation. The southern region produces rice, melons, wheat, peanuts, mulberry, and cotton. It is also a center of commerce, industry, and transportation. Area, 41,818 sq. m.; population, 1953, 41,252,192.

Kiaochow (*jĭ-ou'jō*), a former district or territory in China, located around Kiaochow Bay on the southeastern coast of Shantung Peninsula. The chief city was Tsingtao (*q.v.*).

Kiaochow, former name of the city of Kiao-hsien, China. It is located *ca.* 25 m. N.W. of Tsingtao, in Shantung Province. Once a thriving city, it has lost much of its importance.

Kickapoo Indians (*kĭk-ä-pōō' ĭn'dĭ-ănz*), a tribe of the central Algonquian group. When first found (1667-70), they were living near the portage between the Fox and Wisconsin rivers in what is now Columbia County, Wisconsin. In 1765 they moved southward along the Illinois River and ranged from around Peoria to the Sangamon. One part moved eastward to the Wabash and made its headquarters on the Vermillion River. They played a prominent part in the history of the region, fighting against the U.S. in the War of 1812 and the Black Hawk War in 1832. They ceded their lands in 1809 and 1819 and moved to Missouri and thence to Kansas. One band went to Texas and on to Mexico in 1852 and was joined by a second in 1863. Ten years later part were induced to return and settled in Indian Territory, now Oklahoma. About half remained in Mexico and were granted a reservation in Chihuahua. At present, 360 Kickapoo live on a reservation in Kansas and 290 on a reservation in Oklahoma.

Kicking Horse Pass (*kĭk'ĭng hôrs päs*), a steep Rocky Mountain pass in British Columbia, Canada, located at an altitude of about 5,200 ft. Nearby are the peaks of Mt. Field, Mt. Stephen, and Cathedral Mt.

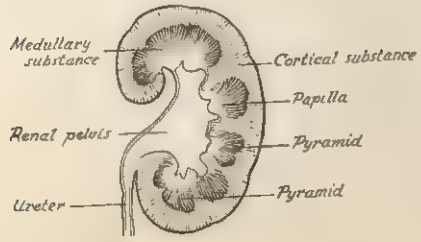
Kidd (*kĭd*), WILLIAM, pirate, known as Captain Kidd, born in Greenock, Scotland, about the middle of the 17th century. He went to sea as a young boy, attained a high reputation for stubborn courage against the French, and in 1691 was granted a reward of $750 from the city of New York. Soon after, he was given command

of a vessel to suppress piracy in the Indian Ocean and for that purpose was furnished with letters of marque. He reached Madagascar in 1697, where, after some time, he was suspected of engaging in the traffic he was commissioned to destroy and later became one of the most noted of pirates. He was arrested on his return to New England in 1699 and sent to England for trial, where he was found guilty of murdering one of his men and was hanged in London on May 24, 1701, though protesting innocence to the last. The trial was unfair and it is quite probable that he was not guilty of the crime for which he was executed. Many adventure stories have been based on the legend that Kidd buried treasures of vast value on the banks of the Hudson or the shores of Long Island Sound.

Kidnap (*kĭd'năp*), to steal, secrete, or carry away any person against his will. The act of kidnaping is regarded by the law as an aggravated species of false imprisonment and embraces the legal elements of that offense. It includes an assault and the act of carrying away or transporting the party injured, either to some place in his own country or to some other country against his will. The statutory penalties for the crime are severe, varying from 10 years' imprisonment to the death penalty.

Kidney (*kĭd'nĭ*), one of two glands which are common to vertebrate animals, whose function is to secrete urea and other waste products from the system. They are situated at the back of the abdominal cavity, one on each side of the vertebral column. In man they are near the fifth rib, but, owing to the position of the liver, the right kidney is somewhat lower than the left. The accompanying illustration shows the internal cavity, which is bounded by the outer *cortical substance*. The conical masses of the *medullary substance*, from 15 to 20 in number, form the *pyramids*. At the apexes of the pyramids are the *papillae*. Above or anterior to each kidney is the *suprarenal capsule*, whose function appears vital upon the blood and muscles. The inner cavity, or *pelvis*, terminates in the ureter. The shape of these organs is that of the kidney bean, the concave side being turned inward and toward the spine, and each is imbedded in a layer of fatty tissue.

SECTION OF KIDNEY



The average weight of the kidney in man is from 4 to 6 oz. It is about 4 in. long, the color is deep red, and the constitution is dense and fragile. The outer part is covered by a thin but tough membrane. A canal, known as the *ureter*, conveys the urine from the kidney to the bladder, where it is retained until a normal quantity has accumulated, when it is expelled from the body. The health depends in a large measure upon the regularity with which the uric acid is taken up by the kidneys. Among the diseases of the kidneys is the well-known Bright's disease (*q.v.*). See *Gout*.

Kieft (*kēft*), WILLEM, colonial administrator, born in The Netherlands; died in 1647. Little is known of his life until 1638, when he came to America is the director general of the New Netherlands. His administration was unsuccessful, being disturbed by domestic contentions and wars with the Indians. In the latter part of his government he was associated with a council of 12 men, but he was superseded by Peter Stuyvesant in 1647. Soon after he sailed for Holland on the *Princess*, which was wrecked in a storm on the coast of England, and he and many other passengers drowned.

Kiel (*kēl*), a city of Germany, capital of Schleswig-Holstein, situated on Kieler Hafen, an inlet of the Baltic Sea. It has extensive shipyards, dry docks, flour mills, iron foundries, tobacco works, machine shops, sugar factories, oil mills, and engineering works. Besides its numerous public schools and historic churches, it is the seat of a noted university, which has an attendance of 1,250 students and a library of 250,000 volumes. It has extensive railroad connections, electric street railways, and communication with the Elbe by a ship canal. As a member of the Hanseatic League it attained much commercial importance. In 1814 it was the seat of the congress that concluded the Treaty of Kiel by which Denmark ceded Norway to Sweden. After World War II it was placed under British occupation. Population, *ca.* 272,000.

Kiel Canal, formerly KAISER WILHELM CANAL, an artificial waterway of Germany, extending from Kiel on the Baltic to Brunsbüttel on the Elbe. It connects the navigation of the North Sea with that of the Baltic Sea. The width at the bottom is 85 ft. and at the surface it is 190 ft. It is 29 ft. deep and 61.3 m. long. This canal shortens the distance from the Baltic to the North Sea about 200 m. It was constructed by the government of Germany for naval and military purposes, and was completed in 1885 at a cost of $39,500,000

Kieran (*kēr'ăn*), JOHN FRANCIS, journalist, born in New York, N.Y., Aug. 2, 1892. He was

graduated from Fordham Univ. *cum laude* in 1912 and in 1915 joined the sports department of the New York *Times*. After working for other newspapers after World War I, he returned to the *Times*, where he remained as featured sports columnist until 1943. From 1938 to 1952 he was also a regular member of the radio and later television program "Information Please" (*q.v.*). Kieran edited the "Information Please Almanac" (1947-53) and "Treasury of Great Nature Writing" (1957). He is the author of "Introduction to Nature" (1955) and, with Arthur Daley, wrote the "Story of the Olympic Games" (1957).

NBC Photo

JOHN KIERAN

Kierkegaard (*kēr'kegōr*), SÖREN AABY, writer and religious thinker, born in Copenhagen, Denmark, May 5, 1813; died there, Nov. 11, 1855. He studied theology at the Univ. of Copenhagen, from which he was graduated in 1840. Except for two years of travel in Europe, he spent his entire life in Copenhagen. His inborn melancholy and the fact that he broke his betrothal developed a guilt complex in him which influenced his theological thinking. His religious studies did not concern any specific questions of dogma, but referred purely to the basic meaning of Christanity and were tinted by his numerous frustrations.

For Kierkegaard, the Christian belief meant, in reality, suffering, since actual life, in its reality, is opposed to the teachings of Christ. He believed that man must strive for the absolute truth even if in practical life he has to pay for this endeavor. Man, he thought, must believe because of the very paradox involved in belief. Belief is paradoxical (*"Credo quia absurdum"*) because its contents contradict reason, but at the same time represent absolute certainty for the ardent believer. Divine grace and the knowledge of the

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SÖREN KIERKEGAARD

forgiveness of sins are, for Kierkegaard, the only facts which make life tolerable. Therefore, real religious life can be lived only as a result of a covenant between the individual and God, never by a person's religious endeavors as a member of a community or of an organized religion.

This point of view brought Kierkegaard into conflict with the official Lutheran Church. During his lifetime, he had great influence on his contemporaries. This went into a half-century of eclipse; but recently, Protestant as well as Catholic scholars frequently refer to the ideas of Kierkegaard. The great Swiss Protestant theologian, Karl Barth (born 1886), has been especially conspicuous in emphasizing the importance of Kierkegaard's theories to those seeking a modern, psychological approach to religion. Since Kierkegaard bases many of his ideas on those of St. Augustine and Pascal (*qq.v.*), it is possible that, had he lived longer, he would have embraced Catholicism.

Kierkegaard's writings are important because he is almost the first European writer to take a modern, analytical, psychological approach to religion. Proust, as well as Joyce, Aldous Huxley, and other contemporary English writers, were influenced by Kierkegaard, and many modern writers who have never read a line of his work have been influenced by Kierkegaard without knowing it.

Kieselguhr (*kē'sĕl-gōōr*), also known as diatomaceous earth, diatomite, infusorial earth, or Tripoli powder. A soft, spongy, porous, silica rock formed by the deposition of the skeletons of tiny water-plants called diatoms, it is light in weight. Resistant to acids and alkalis, it is also a poor conductor. It is found in the U.S., Chile,

Europe, Algeria, and Australia. Kieselguhr is important commercially as a filtering and decolorizing agent as well as an insulator, abrasive, and absorbent.

Kiev (*kē'yĕf*) or KIEFF (in Ukrainian, KIYIV), capital city of the Ukrainian Soviet Socialist Republic and the region of Kiev. It is located on the Dnieper River and is an important commercial and industrial center, producing machines, beet sugar, leather goods, textiles, and other products. The Univ. of Kiev (established here in 1833) is noted for its botanical and zoological gardens. Kiev contains many old buildings, including the Cathedral of St. Sophia, founded in the 11th century. One of the oldest cities in Russia, Kiev was probably settled by the 5th century. In the 9th century it was the capital of the principality of Oleg, considered one of the founders of Russia, and it soon became known to Russians as the "mother of cities." The Greek church was introduced to Russia from Kiev. After the Russian Revolution of 1917, Kiev was alternately held by Germans, Ukrainian revolutionists desiring independence, by the Bolsheviki, and, in 1920, by the Poles. During World War II it was held by Germans (1941-43). Population, *ca.* 1,000,000.

Kilauea (*kē-lou-ä'ä*), one of the most noted volcanoes in the world, situated on the island of Hawaii, in Hawaii National Park. Located about 4,000 ft. above sea level, the crater is oval, about 2 m. wide, and 8 m. to 9 m. in circumference. It is the largest active crater in the world. Notable disturbances occurred in 1790, 1924, and 1955; and many eruptions were observed in the 19th century. Kilauea is on the southeastern slope of Mauna Loa (*q.v.*).

Kilimanjaro (*kĭl'ē-män-jä'rō*), a mountain in northeastern Tanganyika, 98 m. from the port of Mombasa and 150 m. from Victoria Nyanza. It has two elevated peaks or craters called Mawenzi and Kibo. The higher of these is Kibo, which rises 19,340 ft. above sea level and is the highest point in Africa. The summit of Kibo is perpetually covered with snow, but the lower slopes support fine forests. The mountain, discovered in 1848 by Johannes Rebmann of the Church Missionary Society, is the setting of one of Ernest Hemingway's best-known short stories, "The Snows of Kilimanjaro."

Killarney (*kĭl-lär'nĭ*), a town of County Kerry, Ireland, a famous tourist resort. Three beautiful lakes are located in the immediate vicinity. The smallest of the lakes has an area of 430 acres, and the largest, 5,000 acres. Numerous picturesque islands dot their surface; one of them is Innisfallen, which was a famous center of learning at the time of Bede (*q.v.*). Remains of a 14th-century monastery, Muckross Abbey, and of Ross Castle (of the same period) can be seen in the area. Population, 1951, 6,301.

Killdeer (*kĭl'dēr*). See *Plover*.

Killian (*kĭl'ē-ən*), JAMES R., JR., educator and government official, born in Blacksburg, S.C., July 24, 1904. He attended Trinity Coll. and Massachusetts Inst. of Technology, where he studied engineering and business administration. After he was graduated in 1926, he joined the editorial staff of the *Technology Review*, an M.I.T. alumni magazine, and became editor in 1930. In 1939 he was made executive assistant to the president of M.I.T. and in 1949 succeeded him in the presidency. In this position, he stressed the studies of the humanities and social sciences in the education of engineers and scientists. When the scientific and military position of the U.S. was being re-evaluated in 1957, President Eisenhower appointed Killian as his special assistant in science and technology; he resigned on May 28, 1959, to assume the post of chairman of the M.I.T. Corp. Killian has long stressed the military importance of scientific progress, the need for better science training in public schools, and the importance of basic research.

Killifish (*kĭl'ĭ-fish*), popular name of many species of small minnowlike fish belonging to the family *Cyprinodontidae*. They inhabit both fresh and salt water and because of their small size are frequently used as bait.

Kilmainham (*kĭl'män-hăm*), a locale in County Dublin, Ireland, now a part of Dublin City. The Royal Hospital for wounded and pensioned officers, founded by King Charles II, is located here. Charles Parnell was confined in Kilmainham jail in 1882, where he negotiated with the British government the so-called Kilmainham treaty (see *Parnell, Charles*).

Kilmer (*kĭl'mĕr*), ALFRED JOYCE, poet, born in New Brunswick, N.J., Dec. 6, 1886; died near Seringes, France, July 30, 1918. Kilmer did editorial work on the *Churchman* (1912-13), and the New York *Times* (1913-17), meanwhile contributing verse to magazines. He went to France with the American Expeditionary Force in World War I and was killed in action shortly before the armistice. Although he is best known for the famous poem "Trees," he published several volumes of verse, including "Summer of Love" (1911), "Trees and Other Poems" (1914), and "Main Street and Other Poems" (1917).

His wife, ALINE MURRAY KILMER (1888-1941), a native of Norfolk, Va., a poet in her own right, wrote "Candles That Burn" (1919), "A Buttonwood Summer" (1929), and other books.

Kiln (*kĭl*), a structure used for baking and glazing such objects as bricks and pottery, for calcining lime and other substances, and for drying and baking such vegetable products as hops, malt, and corn. All kilns are designed to generate an abundance of constant heat with the least possible consumption of fuel. Those intended for dry-

ing and baking cereals, or their products, are often constructed of light material, while those designed for generating great heat are made of the best fire-clay brick. According to the course of the draught, they are classified as *up-draught* and *down-draught*. See also *Brick*.

Kilogram (*kĭl'ô-grăm*), a measure of weight in the metric system (*q.v.*).

Kilogrammeter (*kĭl'ô-grăm-mē-tĕr*), a measure of energy, being the amount expended in raising one kilogram through the height of one meter, in the latitude of Paris, France.

Kilometer (*kĭl'ô-mē-tĕr*). See *Metric System*.

Kilowatt (*kĭl'ô-wŏt*). See *Electrical Units*.

Kilpatrick (*kĭl-păt'rĭk*), HUGH JUDSON, soldier, born near Deckertown (now Sussex), N.J., Jan. 14, 1836; died in Valparaíso, Chile, Dec. 2, 1881. A graduate (1861) of the U.S. Military Acad., he was wounded in the Civil War battle of Big Bethel, Va., a short time later. He organized a regiment of New York cavalry which took part in most of the important cavalry engagements in the East, and was brevetted brigadier general of volunteers in 1863. In 1864-65 he commanded a division of cavalry in Gen. Sherman's march to the sea and the subsequent campaigns in the Carolinas. Kilpatrick won the brevets of brigadier general and major general in 1865. Retiring from the Army, he later served as U.S. minister to Chile (1865-69, and again in 1881).

Kilpatrick, WILLIAM HEARD, educator, born in White Plains, Ga., Nov. 20, 1871. He was graduated from Mercer Coll. (1891) and received a Ph.D. degree from Columbia Univ. (1912). In 1900 he joined the faculty of Teachers Coll., Columbia Univ., and served as professor of the philosophy of education from 1918 until his retirement in 1938.

Kimball (*kĭm'bəl*), FISKE, architect, historian, and author, born in Newton, Mass., Dec. 8, 1888; died in Munich, Germany, Aug. 14, 1955. A graduate (1909) of Harvard Univ., he headed (1923-25) the fine arts department of New York Univ. and in 1925 became director of the Philadelphia Museum of Art. He directed the restoration of the home of Thomas Jefferson at Monticello and of other historic buildings. He published "American Architecture" (1928) and "Great Masterpieces of Painting in America" (1948, with L. Venturi).

Kimberley (*kĭm'bĕr-lĭ*), a city in northern Cape of Good Hope Province, Union of South Africa, near the border of the Orange Free State, about 650 m. N.E. of Cape Town. Kimberley is the center of the South African diamond-mining industry; the Kimberley, De Beers, and other famous mines operate nearby, all under control of a trust organized (1888) by Cecil Rhodes. The city was founded in 1871, and was (1873-80) the capital of Griqualand West, before becoming part of the Cape Colony. In the Boer War Kimberley was besieged for four months by a Boer force under Piet Cronje. Population, 1946, 55,909, of whom 19,067 were Europeans.

Kimhi (*kĭm'kē*) or KIMCHI, a family of 12th-century Hebrew scholars and grammarians, especially David Kimhi (1160-1235), who lived and worked in Narbonne, France. His "Book of Completeness" was for many years the best Hebrew grammar. He also wrote "Pen of the Writer," a guide to the punctuation of Biblical manuscripts.

Kimmel (*kĭm'əl*), HUSBAND EDWARD, naval officer, born in Henderson, Ky., Feb. 26, 1882. Kimmel was graduated from the U.S. Naval Acad. at Annapolis in 1904 and was commissioned an ensign two years later. He continued in the navy, serving through the First World War, and advanced through the grades to the rank of admiral (February 1941). Named (1941) commander of the U.S. fleet in the Pacific, he was criticized for the unpreparedness of the American naval forces at the time of the Japanese surprise attack on Pearl Harbor (*q.v.*). He was relieved of his command in December 1941 and retired from active duty. See also *Short, Walter C.*

Kin (*kĭn*), a group of people who are, or claim to be, descended from a common ancestor. In Western countries such descent is commonly traced through both the male and the female lines. In primitive civilizations where totemism is observed, different tribes having the same totem frequently regard themselves as kin to one another. Large groups, such as the gens in ancient Rome or the clan in Scotland, are founded on ideas of kinship. See also *Relationship*.

Kin (*kĭn*), NEXT OF, in law of descent and distribution, those persons who are most nearly related by blood and may share in the estate of a deceased person dying intestate. In some states of this country husband and wife are not included in the statute defining the term, and in constructing a will the intention of including either one must be clearly stated.

Kindergarten (*kĭn'dĕr-gär-tĕn*), the name of that system of education generally preferred for children from four to six, or the name for the school presenting that system, based on the philosophy of Friedrich Froebel together with the findings resultant from ever-continuing broad and intensive child study.

Froebel's philosophy was the outcome of his experiences. His early years were shadowed by poverty and neglect. Until he became a member of his uncle's family and was sent to the village school, he had attended only a class for girls, and adjustment was now so difficult that this naturally thoughtful, studious boy was considered incapable of learning. Consequently, his uncle apprenticed him to a forester. It was in the Thuringian Forest, Germany, that Froebel learned the lessons which

so greatly influenced his thinking and which later resulted in his progressive methods of teaching. He gained a profound insight into the uniformity and unity of nature's laws and was convinced that since man and nature proceed from the same Source, man, too, must be governed by uniform laws. He began to study in earnest, and probably read from Comenius and Rousseau. He attended college and also studied under Pestalozzi (*q.v.*), but he was eager for more knowledge of natural science than this teacher advocated. Later, army experiences taught him the value of discipline and united action—the responsibility of the individual to the group and the protection due the individual from the group.

Froebel tried several occupations, but teaching alone gave him satisfaction. In his school at Keilhau, he practiced his own philosophy—a fundamental principle of which was that knowledge must always be secondary to development. This idea put new emphasis on the early years, and his notable work, "The Education of Man," deals chiefly with the child under seven.

The Swiss government, quick to recognize Froebel's unusual insight and ability, sent young teachers to him for instruction. At Burkdorf, where he also established an orphanage, elementary teachers of the canton came every two years for three months' study and discussion of their individual teaching problems.

Here the need for pre-elementary education was continuously in evidence. Repeatedly, teachers asserted that neglect or some unfortunate experience undergone by the child before entering the school was the chief cause of unsatisfactory progress. Froebel could well understand this, and his experiments with the little children in his orphanage encouraged him.

Convinced beyond doubt that in education, as in nature, the perfection of the latter stage depends upon the perfection of the former, he now worked to formulate a system suitable for the education of the very young. He knew it must be one requiring neither books nor school lessons—a graduated course of exercises based on games. The exercises must be those in which the children would delight, as well as a series of employments that would strengthen their bodies, sharpen their senses, and acquaint them with their immediate surroundings and with their companions. In his games, songs, and exercises, he aimed to awaken the child to spiritual truths and to make him aware of the interdependence and natural unity of individuals and society. Froebel's "gifts"—the six color balls; the sphere, cube, and cylinder; the two-inch cube divided into eight cubes; the two-inch cube divided into eight oblong blocks; and the two three-inch cubes having more complex divisions—together with the material accompanying each gift, were to assist the child who handled them to comprehend relationships. All activities were to proceed in a play spirit, teachers were to encourage independent self-activity, and always, the child was to be happy.

Froebel's trial class—called, when translated, Small-Children-Occupation-Institute—was opened at Blankenburg in 1837. This was really the first *kindergarten*, though that name, meaning children's garden, was not given to it until 1840.

Said Froebel: "People think the child is only seeking amusement when it plays. That is a great error. Play is the first means of development of the human mind; its first effort to make acquaintance with the outward world, to collect original experiences from things and facts, and to exercise the powers of body and mind." To those who contended that teachers were superfluous if children were to play, he answered: "Without rational, conscious guidance, childish activity degenerates into aimless play instead of preparing for those tasks of life for which it is destined."

An edict, in 1851, forbidding the establishment of kindergartens in Prussia was a blow to their founder, but the kindergarten idea was to live, grow, and spread its influence far and wide. Froebel's most brilliant pupil, the Baroness von Marenholtz-Bülow, lectured on the subject in practically all the countries of Europe, and kindergarten teacher training schools soon ceased to be unusual and kindergartens multiplied.

In America, the first kindergarten was opened in Watertown, Wis., in 1858 by Mrs. Carl Schurz; the first kindergarten for English-speaking children was opened in Boston, Mass., in 1860 by Elizabeth Palmer Peabody. Through the efforts of Susan Blow, St. Louis, Mo., in 1873, became the first city to include kindergartens as a permanent part of the public school system.

Special training for anyone who is to teach a kindergarten successfully is so necessary that many states have passed laws on the subject, and in most others, state or city school boards maintain very definite standards. Today, the spirit of the kindergarten has, in many cases, permeated the entire school system to a marked extent. Especially is there co-ordination between the kindergarten and the lower grades. The expression "kindergarten-primary" does not mean merely kindergarten and primary levels, but, even more, it means a blending of purposes and an upward trend in the acceptance and incorporation of kindergarten principles.

The modern kindergarten of the U.S. is a worthy descendant of Froebel's first effort. The outer form has changed in respect to materials, equipment, procedure, techniques, but the highlights of the Froebelian philosophy—child happiness, recognition of interdependence, and growth of character through purposeful spontaneous activity in an environment of freedom—are brighter

Courtesy National Kindergarten Assn., N. Y.

KINDERGARTEN

than ever before. Teachers now have the benefit, through colleges and kindergarten-training schools, of many years of carefully recorded observations regarding the development of the young child, in all aspects of his life, and they are taught to study each child individually, and to co-operate as closely as possible with his parents. Froebel said he tried to make kindergartens "free republics of childhood." In the U.S. kindergarten, the child clearly understands liberty—not the word, but its practice. He knows that he may express his thoughts, make choices, and carry out his plans, but that these privileges must be shared equally or they will disappear.

ORGANIZED ASSISTANCE. The Nursery-Kindergarten-Primary Division of the U.S. Office of Education, Washington, D.C., and the Association for Childhood Education, 1201 16th Street, N.W., Washington 6, D.C., assist kindergarten teachers and supervisors relative to kindergarten methods and procedure. The National Kindergarten Association, 8 West 40th Street, New York 18, N.Y., furnishes free leaflets on kindergarten values, for distribution, and lends a program and film to persons interested in securing the opening of a kindergarten in a public school.

Kinematics (*kĭn-ē-măt'ĭks*), the branch of mechanics which treats motion without regard to the force producing motion and the body which moves. Kinematics is concerned primarily with description of position, velocity and acceleration of the moving body. Two kinds of motion are recognized, translation and rotation. Either of these may occur as uniform motion or as vibration. Many bodies have both translational and rotational motions.

Kinesthesia (*kĭn-ĕs-thē'zhĭ-ä*). See *Muscular Sense.*

Kinetic Energy (*kĭn-ĕt'ĭk ĕn'ĕr-jĭ*), in physics, the energy possessed by bodies in motion. See *Energy.*

Kinetic Gas Theory (*kĭn-ĕt'ĭk găs thē'ō-rĭ*), the theory relating the physical properties of a gas (*q.v.*) with the mechanical properties of its constituent molecules and the intermolecular forces. In its simplest form, this theory assumes that gases consist of molecules which undergo only elastic (*i.e.*, kinetic energy conserving) collisions with one another and the walls of their container, which exert no mutual forces, and whose distribution of velocities does not change with time. From these postulates and the laws of mechanics, the equation of state of an ideal gas, $pV=nRT$, may be derived if the molecular kinetic energy is supposed proportional to the absolute temperature T. Actual gases follow the above law only approximately. A better correlation between theory and experiment follows when the finite size of the molecules, the forces acting between adjacent ones, the fact that they may have vibrational and rotational energy, and the distribution of their velocities according to the Maxwell-Boltzmann formula are all taken into account. Besides the equation of state of the gas, relating pressure, volume, and temperature, such additional properties as specific heat, viscosity, and thermal conductivity may be computed from kinetic gas theory.

Kinetoscope (*kĭ-nē'tō-skōp*), or VITASCOPE. See *Moving Pictures.*

King (*kĭng*), a title to designate the supreme ruler of a nation or country. The term was probably derived from khan and other eastern terms of similar meaning. The difference between a king and an emperor is not always one of power or extent, but is sometimes the result of historical developments. Though Louis Philippe was satisfied with the title of king, Napoleon III, who governed the same dominions, assumed that worn by Napoleon I. In very ancient times and during the period of absolutism the king was considered the representative of God on earth and was absolute in ruling his domain. This distinction was lost or modified with the growth of the spirit of liberty among the people. In the 19th and 20th centuries, European monarchies were gradually changed into constitutional monarchies.

King, CLARENCE, geologist, born in Newport, R.I., Jan. 6, 1842; died in Phoenix, Ariz., Dec. 24, 1901. He was graduated from Yale Univ. in 1862 and subsequently engaged in geological surveys in the Far West. King also made a de-

tailed survey of the Yosemite Valley. He made a geological-topographical survey, 1867-72, along the 40th parallel across the widest part of the Cordilleras, from California to Eastern Wyoming, and in 1879 was made first director of the U.S. geological survey. He resigned the position and devoted the remainder of his life to the practice of a mining engineer and scientific investigations. His publications include: "Systematic Geology," "The Age of the Earth," and "On Mountaineering in the Sierras."

King, ERNEST JOSEPH, naval officer, born in Lorain, Ohio, Nov. 23, 1878; died in Portsmouth, N.H., June 25, 1956. Graduated from the U.S. Naval Acad. in 1901, King had previously served as a midshipman in the Spanish-American War. He advanced steadily through the grades and was commissioned rear admiral (1933), admiral (1941), commander-in-chief of the U.S. Fleet in the Atlantic (1940), and of the combined fleet (December 1941), after the entry of the U.S. into World War II. He was made Chief of Naval Operations in 1942 and was awarded the D.S.M. (twice) and the Navy Cross. King retired with the permanent rank of admiral in 1945. He published "Fleet Admiral King" in 1952.

ERNEST J. KING

King, MARTIN LUTHER, clergyman, Negro leader, born in Atlanta, Ga., Jan. 15, 1929. Educated at Morehouse Coll., he became pastor of the Dexter Ave. Baptist Church, Montgomery, Ala., and internationally known as leader of the Negro movement against segregation (*q.v.*) in the Southern states. King advocated a policy of nonviolent agitation along lines followed in India by Mohandas K. Gandhi (*q.v.*). Although he was several times physically injured during the bus boycott and sit-down strikes in Montgomery and elsewhere, King persevered in his insistence that the Negro demonstrators must not retaliate with violence of their own.

King, RUFUS, statesman, born in Scarborough, Me., Apr. 29, 1755; died at Jamaica, L.I., Apr. 29, 1827. In 1777 he was graduated from Harvard Univ., studied law, and entered upon a successful practice at Newburyport, Mass. He was elected a member of the legislature in 1782 and to the

RUFUS KING

Continental Congress at Trenton in 1784, where he introduced a resolution favorable to the abolition of slavery in the territories of the U.S. In 1787 he was a member of the Federal Constitutional Convention, and in 1796 President Washington appointed him minister to England, in which position he served eight years. He was reelected to the U.S. Senate in 1813, having served in that capacity before his appointment to England, continuing in that position until 1825, when he was again appointed minister to England. Owing to ill health, he resigned the following year and returned to the U.S. As a statesman and orator King took high rank among the noted men of America, while as an opponent to slavery he was among the earliest and most persistent. His son, Charles King (1789-1867), was editor of the *New York American*, and from 1849 until 1863 served as president of Columbia Coll. He published "New York Fifty Years Ago."

King, THOMAS STARR, clergyman, lecturer, and author, born in New York City, Dec. 17, 1824; died in San Francisco, Calif., March 4, 1864. Largely self-educated, he became prominent as a lecturer and Unitarian preacher in Boston. An enthusiastic nature lover, he described the beauties of New Hampshire in his book "The White Hills: Their Legends, Landscapes, and Poetry" (1859). King was (1860-64) pastor of the Unitarian Church in San Francisco; at the beginning of the Civil War, his lectures and patriotic appeals aided in aligning California with the Union.

King, WILLIAM, poet and humorist, born, probably in London, England, in 1663; died there, Dec. 25, 1712. Educated at Westminster School and Oxford Univ., he became an advocate in London. With Jonathan Swift and others he carried on a controversy with Richard Bentley (*q.v.*); King's "Dialogues of the Dead" (1699) was a clever attack on Bentley. His other writings include "Miscellanies in Prose and Verse" (1705) and "Useful Transactions in Philosophy" (1709). King is the subject of one of Samuel Johnson's "Lives of the Poets."

King, WILLIAM LYON MACKENZIE, statesman,

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MACKENZIE KING

born at Kitchener, Ontario, Canada, Dec. 17, 1874; died in Kingsmere, July 22, 1950. He studied in schools of his native city and was graduated from the Univ. of Toronto. From 1896 to 1897 he was fellow in political economy at the Univ. of Chicago, and subsequently he held a like position at Harvard Univ. In 1900 he was made deputy of labor and for several years published the *Labor Gazette*. From 1909 until 1911 he was minister of labor in the administration of Sir Wilfrid Laurier. Subsequently he remained active in public service and is the author of much literature relating to legislation and affairs of labor and commerce. In 1921 he was elected premier of Canada, defeating Premier Meighen, who was running for re-election. In the election of 1926, following a dissolution of Parliament, his parties, the Liberals and the Liberal-Progressives, received increased strength, defeating the Conservatives, and he again became premier. However, in the election of 1930 his party was defeated by a decisive vote, and he was succeeded as premier by Richard B. Bennett of Calgary, Alberta, leader of the Conservative party.

In 1935 King, as a Liberal, again led the opposition and won the most sweeping election victory since the federation. He served as prime minister, and as president of the privy council, and in 1949 resigned as premier and Liberal party head. In World War II, the prime minister cooperated with President Franklin D. Roosevelt in continental defense, planning and took an active part in the San Francisco Conference (1945). Among his published books is "Canada at Britain's Side" (1941).

King, WILLIAM RUFUS DEVANE, statesman, born in Sampson County, N.C., April 6, 1786; died in Dallas County, Ala., April 18, 1853. A graduate (1803) of the Univ. of North Carolina, he practiced law and served in the state legislature. He was a member of Congress from North Carolina (1811-16), U.S. Senator from Alabama (1819-44), U.S. minister to France (1844-46), and, once more, Senator from Alabama (1848-53). King was elected Vice President of the U.S. in 1852, on the ticket headed by Franklin Pierce, but died shortly after taking the oath of office.

Kingbird (*kĭng'bûrd*), one of the tyrant flycatchers (see *Flycatcher*) of North America, sometimes known locally as bee martin because of its fondness for bees as well as other insects. It is about 8 in. long, dark gray above and white below, with blackish wings and tail, the latter with a broad band of white across the tip. The top of the male's head is blackish with a concealed patch of orange red; the female's crown is grayer with a smaller bright patch. In addition to insects, which the kingbird is adept at catching on the wing, the bird's food includes a few small fruits and, on occasion, seeds. It is aggressive and fearless and does not hesitate to attack much larger birds, such as hawks and crows, that appear in its neighborhood. The kingbird's nest is relatively large and usually placed on branches at moderate heights, often over water. Three to five eggs are laid, creamy white with irregular spots of various brownish hues. The bird nests over most of the U.S. and southern Canada and winters from Central America south to Bolivia and southern Brazil.

King Crab (*kĭng krăb*). See *Horseshoe Crab.*

Kingdon (*kĭng'dŭn*), FRANK, clergyman, educator, and author, born in London, England, Feb. 27, 1894. He came to the U.S. in 1912 and was ordained a Methodist minister. He became a U.S. citizen in 1918. After studying at Boston Univ., Harvard Univ., Michigan State Coll., and Albion Coll. and holding various pastorates in the Eastern Methodist Conference, Kingdon became (1934) president of Dana Coll. in Newark, N.J. From 1936 to 1940 he was president of the Univ. of Newark, resigning to work in behalf of democratic causes. He has written a syndicated newspaper column and a number of books, including "Humane Religion" (1930), "An Uncommon Man: Or, Henry Wallace and 60,000,000 Jobs" (1945), and "Architects of the Republic" (1949).

King Edward VII Land or EDWARD VII PENINSULA, a peninsula of the antarctic mainland, extending about 100 m. N.W. from Marie Byrd Land, east of the Ross Shelf Ice. First sighted in 1842, the peninsula was explored in 1902 by Robert F. Scott (*q.v.*), who named it.

Kingfisher (*kĭng'fĭsh-ẽr*), one of a family of birds of nearly worldwide distribution. Many of the species feed largely on fish, as the name indicates, which they capture by diving into the water from an observation perch or from a hovering position over the water. Numerous species, however, are forest dwellers, away from streams or ponds, and prey on small animal life such as in-

sects, lizards, and snakes. Three species occur in the U.S., two of which, the *green* and the *ringed kingfishers*, are of wide distribution from Mexico to Tierra del Fuego and barely reach the southwestern border of the U.S. The ringed kingfisher, indeed, reaches the U.S. only by accident. The *belted kingfisher*, a larger species, nests over most of the U.S. and much of Canada and Alaska, wintering from southeastern Alaska across to New England and south through the West Indies and Mexico to northern South America. Kingfishers nest in burrows which they excavate in the banks of streams or dry hollows, or, for some species, in termite nests or hollow trees. The eggs are white. Some of the species are beautiful, but others are more soberly clad. Among the less colorful is the *kookaburra*, or laughing jackass, of Australia, whose loud, maniacal cry has made it famous. Kingfishers have been the subjects of superstition and mythology since ancient times.

King George's War, 1744-48, the third of the Anglo-French wars in North America. See *French and Indian Wars.*

Kinglet (*kĭng'lĕt*), the name given in America to two diminutive species of birds belonging to the group of Old World warblers, closely related to the thrushes. Other species are found in Europe and Asia. Of the American forms, the *golden-crowned kinglet* has a broad central stripe of orange on the crown, narrowly bordered with yellow (all yellow in the female) and then with a broad stripe of black, followed by a dull whitish stripe over the eye. The *ruby-crowned kinglet* has a bright red patch on the crown, partially concealed (lacking in the female), and a broad whitish eye ring. Both species are otherwise dull grayish-olive above and dull yellowish below, but with broad wing bars. They are active little birds, and the ruby-crowned species has a surprisingly loud song for a bird of its size. Both nest as far north as Alaska and winter, in one subspecies or another, from southern Canada to Guatemala.

King Philip (*kĭng fĭl'ĭp*), American Indian leader. See *Philip, King.*

King William's War, 1689-97, the first of the Anglo-French wars in North America. See *French and Indian Wars.*

Kings, BOOKS OF, two books of the Old Testament. Of uncertain authorship, they form a continuous narrative of the Hebrew people from the end of King David's reign to the halfway mark of the Babylonian captivity and were probably written during the latter period. They are not separated in the Hebrew manuscripts but were divided into two books in the Septuagint. In the Authorized (King James) Version, they are called I and II Kings; in the Greek versions and the Western canon (in which the books of Samuel are called I and II Kings), they are known as III and IV Kings.

Kings Bay, in Norwegian, KONGSFJORD, an inlet, about 15 m. long, in the northwest coast of West Spitsbergen. The site of a coal-mining settlement, Kings Bay was the base for polar flights of Adm. Richard E. Byrd (1926) and other explorers.

King's Bench (*kĭngz bĕnch*) or QUEEN'S BENCH, in jurisprudence, an ancient English court of common law; part of the English High Court of Justice. It has jurisdiction over all criminal and many civil cases. The King's Bench is a superior court with the right to supervise the jurisdiction of certain inferior courts.

King's Counsel (*kĭngz koun'sĕl*) or QUEEN'S COUNSEL, abbreviated as K.C. or Q.C., in jurisprudence, an honorary title given to certain barristers in England.

Kingsley (*kĭngz'lē*), CHARLES, author and clergyman, born at Holne, Devonshire, England, June 12, 1819; died at Eversley, Hampshire, Jan. 23, 1875. He studied at King's Coll., London, and at Cambridge Univ., becoming (1842) curate and then rector of Eversley. He was professor of English literature at Queen's Coll., London (1848-49), and professor of modern history at Cambridge (1860-69); he became canon of Chester (1869) and of Westminster (1873). A leading Christian Socialist, Kingsley wrote many pamphlets and two novels, "Yeast" (1848) and "Alton Locke" (1850), discussing the goals of the group. John Henry Newman (*q.v.*) wrote his famous *"Apologia pro vita sua"* in answer to a statement made by Kingsley. Kingsley's later writings include "Westward Ho!" (1855) and "The Water Babies" (1863).

Kingsley, HENRY, novelist and journalist, born at Barnack, Northamptonshire, England, Jan. 2, 1830; died at Cuckfield, Sussex, May 24, 1876. A brother of Charles Kingsley (*q.v.*), he left Oxford Univ. without graduating and spent several years (1853-58) in Australia. In 1869 he became editor of the Edinburgh *Daily Review*, for which he served as war correspondent during the Franco-Prussian War (1870-71). His best-known books are "Recollections of Geoffrey Hamlyn" (1859), "Ravenshoe" (1862), and "Mademoiselle Mathilde" (1868).

Kingsley, SIDNEY, playwright, born SIDNEY KIESCHNER in New York City, Oct. 18, 1906. He graduated from Cornell Univ. in 1928. His first successful play, "Men in White" (1933), won the 1934 Pulitzer Prize. His later plays include "Dead End" (1935); "The Patriots" (1943), which was called the best play of the season by the New York Drama Critics Circle; and "Detective Story" (1949). In 1951 Kingsley wrote and staged an adaptation of the novel "Darkness at Noon" by Arthur Koestler (*q.v.*), which also won a Drama Critics Circle award.

King's Mountain (*kĭngz moun'tĭn*), the

name of a mountain range in North Carolina, trending north and south through Gaston and adjoining counties. It was the scene of a battle on Oct. 7, 1780, between the British and Americans. The Americans were commanded by Benjamin Cleaveland and the British by Col. Ferguson. The battle terminated in favor of the Americans, but they lost a brilliant soldier, Col. James Williams. However, the British lost 716 men as prisoners and 390 killed, including Ferguson. The Americans lost only 28 killed and 60 wounded. This battle had a favorable influence upon the American cause.

Kingsport (*kĭngs'pôrt*), a city of Sullivan County, Tennessee, on Holston River, in the mountainous northeast region of the state near the Virginia line. It is served by the Clinchfield and Holston R.R.'s and is surrounded by an agricultural region producing tobacco, grain, and livestock. Manufactures include pulp and paper books, brick, cement, glass, hosiery, chemicals, plastics, synthetic yarn, cotton cloth, castings, and industrial equipment. Kingsport was laid out in 1915, and was incorporated in 1917. Population, 1930, 11,914; in 1940, 14,404; in 1950, 19,571.

Kingston (*kĭngs'tŭn*), city and county seat of Ulster County, N.Y., on the Hudson River, 87 m. N. of New York City. It is on the New York Central and New York, Ontario, & Western R.R.'s. The chief buildings include the public library, the county courthouse, the armory, and the city hall. Located in Kingston is the Senate House, which was formerly the meeting place of the state legislature and now contains a collection of relics. Large quantities of timber and building stone are obtained in the vicinity, which is also a large fruit-growing section. It is a trading center in farm products, lumber, and merchandise. The manufactures include brick, cement, farm machinery, cigars, and clothing; shipbuilding is among the city's industries. Kingston was first settled in 1652 by the Dutch, who called it Esopus. Named Wiltwyck in 1661, it was taken by the English in 1664 and the name changed to Kingston. Later it was the capital of the state, when, in 1777, the first state constitution was adopted here. It was incorporated in 1872. Population, 1950, 28,817.

Kingston, chief seaport and capital since 1872 of the island of Jamaica in the British West Indies. It lies on the southeast side of the island on a beautiful land-locked harbor, surrounded by a dry and healthful region. The town was founded in 1693 after nearby Port Royal had been destroyed by earthquake the preceding year. Kingston was almost entirely rebuilt with modern public works following the severe earthquake of 1907. In 1780, 1843, 1862, and 1880 there were disastrous fires. The suburbs are noteworthy for their beautiful homes and gardens. Adm. Benbow (died 1702) was buried in Parish Church here, founded about 1692. Kingston has a naval base leased by the U.S. Population in 1943, 109,056; in 1953 (est.), 138,887 (incl. suburbs).

Kingston, a city of Ontario, capital of Frontenac County, on the northeastern shore of Lake Ontario, and on the Canadian Pacific, the Canadian National, and other railroads. It is situated on the Bay of Quinte, near the source of the St.

OLD SENATE HOUSE, KINGSTON, N. Y.

The Senate of the State of New York met here in 1777, the year in which the first constitution of the State was adopted

Courtesy New York State Dept. of Commerce

Lawrence, and is connected with Ottawa by the Rideau Canal. Kingston is 165 m. from Toronto and 172 m. from Montreal. It has a large trade in manufactures and produce. The chief buildings include the Royal Military Coll., the Univ. of Queen's Coll., the Anglican and Roman Catholic cathedrals, the penitentiary, and the public library. In the public park is a bronze statue of Sir J.A. Macdonald. Located near the Thousand Isles, it is frequented during the summer by many tourists.

Kingston has a good harbor and extensive shipyards. The manufactures include locomotives, edge tools, hardware, railway cars, clothing, cotton and woolen textiles, and spirituous liquors. It was made the site of a French fort in 1673, and was incorporated in 1838. Originally the name was Ft. Frontenac, but this was changed to Kingston after the American Revolution. Population, about 25,000.

Kingston-upon-Hull, or HULL, a river port of England, in the East Riding of York, on the north bank of the estuary of the Humber, where it is joined by the Hull. The city was chartered by Edward I in 1299. In the Civil War it was held by the Parliamentary forces, and successfully repulsed the Royalists at two different sieges. Population, *ca.* 313,400.

Kinkajou (*kĭn'kȧ-jōō*), or POTTO, a small mammal found in the tropical parts of South America. It resembles the raccoon, is nocturnal in habits, and feeds upon insects and small animals. The fur is soft and gray and the tail is prehensile. This animal is tamed and treated as a pet in some parts of Central America.

Kioto (*kyō'tō*). See KYOTO.

Kiowa (*kī'ō-wā*), a tribe of North American Indians, formerly numerous in the upper region of the Missouri River. They were considered the most savage and warlike tribe of the prairies, where they were dreaded by the early settlers, and formerly carried their raids as far south as the Gulf of Mexico. In 1875 they were removed to Oklahoma, where they became more or less associated with the Comanches. At present they number about 1,125.

Kipling (*kĭp'lĭng*), (JOSEPH) RUDYARD, writer, born of English parents in Bombay, India, Dec. 30, 1865; died in London, England, Jan. 18, 1936. The boy was sent to England for his schooling. He returned to India, where he became a journalist in 1882. To his newspaper days may be traced the Anglo-Indian stories and poems which made him popular. "Plain Tales From the Hills" and "Soldiers Three"—short-story collections—both appeared in 1888; "Barrack-Room Ballads"—poems, including "Gunga Din"—was published in 1892. Kipling established himself in London in 1889, then traveled extensively. He married an American in 1892 and lived in Brattleboro, Vt.,

RUDYARD KIPLING

for four years, returning to England in 1897. His writings, which made him wealthy, also made Kipling a symbol of the type of British imperialism indicated by the "white man's burden," a phrase he popularized. In 1907, however, he was awarded the Nobel Prize for literature, the first Englishman to be so honored. Among his many books, the most enduring have been the novel "Kim" (1901) and his children's stories ("The Jungle Book," 1894; "Stalky & Co.," 1899; "Just-So Stories," 1902; "Puck of Pook's Hill," 1906, etc.); his "Recessional" (1897) is a well-known hymn. Kipling's autobiography, "Something of Myself," appeared in 1937.

Kipnis (*kĭp'nĭs*), ALEXANDER, singer, born in Zhitomir, Ukraine, Feb. 1, 1896. He studied in Warsaw, Poland, and in Berlin, Germany, making his debut as a singer in Wiesbaden, Germany, in 1917. A member of the opera companies of Berlin and of Munich, Germany, and of the Metropolitan Opera Co., in New York City, he toured extensively as a guest artist and recitalist. Kipnis was noted for his Wagnerian basso roles, for his *Boris* (in Musorgski's "Boris Godunov"), and for his interpretations of lieder.

Kipper (*kĭp'ẽr*), from kippa, the Scotch name for a salmon after spawning time. Since fresh salmon is less palatable after the fish has spawned, the meat is often dried and smoked. Thus, kipper has come to refer to this manner of curing and to salmon or herring cured in this way.

Kirby-Smith (*kûr'bĭ-smĭth'*), EDMUND. See *Smith, Edmund Kirby.*

Kirchhoff (*kĭrk'hŏf*), GUSTAV ROBERT, physicist, born in Königsberg, Prussia, March 12, 1824; died in Berlin, Oct. 17, 1887. He was given successive appointments to the universities of Breslau (1850), Heidelberg (1854), and Berlin (1875). He did much valuable research in the field of thermodynamics, and his work in the

physical sciences included formulation of the important "Kirchhoff's law" of electric currents and electromotive forces in a network and the emissive power of bodies at given temperatures in optics. He also studied the solar spectrum and thermal conductivity, and, with R.W. Bunsen, he discovered the spectroscope, by means of which the two men were able to analyze the spectrum (1859) and, subsequently, to discover two new elements, cesium and rubidium (1860).

Kirghiz (*kĭr-gēz'*), the name of a Tartar-Mongol nomadic people of Asia. They occupy a vast region which extends from the Caspian Sea to the Altai Mts., and from the Syr Daria River and the Sea of Aral to the Tobol and the Irtish. This section is characterized by several mountain ranges. It includes many salt lakes and the great steppe region. In language these people belong to the Turkish stock and many have embraced the creed of Islam. The total number of this race is placed at 3,000,000.

Kirghiz Soviet Socialist Republic, embracing 76,900 sq. m. in Central Asia, bordering on the Sinkiang province of China. The capital is Frunze, with a population of 93,000. Formerly a colony of Czarist Russia, Kirghiz became an autonomous republic in 1926, and 10 years later was made a union republic. Two-thirds of its population are Kara-Kirghiz (Turkish-Tartar tribe). Raising of cattle, horses, and sheep is their main occupation. Sugar refineries, a large meat-packing plant, a silk mill and cotton carding works have been established. Mineral resources have only recently begun to be exploited. Coal mines opened provide much of the supply for other Central Asiatic republics. Mercury, petroleum, antimony, and polymetallic ores are mined. The area under crop doubled before World War II, and has increased greatly since then. Crops include wheat, barley, corn, sugar beets, the poppy (for medicinal opiates), tobacco, cotton, clover as cattle feed, and fruits. There are four colleges, 20 technical high schools, and two scientific research institutions. The majority of the people, until recently illiterate, are of the Mohammedan faith.

Population, *ca.* 1,500,000.

Kirin (*kĭr'ĭn*), a province of Manchuria, China, containing the famous port city of Harbin. Along with Jehol, Heilungkiang, and Fengtien, Kirin was proclaimed part of the Japanese puppet state of Manchukuo, on Feb. 18, 1932, during the Sino-Japanese conflict. The capital is Kirin, a treaty port on the Sungari River. With the defeat of Japan Kirin reverted to the Chinese. By 1948 Chinese Communists had seized all of Manchuria, including Kirin. Area, 34,616 sq. m. Population, *ca.* 5,500,000.

Kirk (*kĭrk*), ALAN GOODRICH, naval officer, born in Philadelphia, Pa., Oct. 30, 1888. He was graduated from the U.S. Naval Acad. in 1911, served in various naval posts, and by 1939 was naval attaché to the U.S. Embassy in London. In 1940 he was appointed director of naval intelligence and, after the U.S. entered World War II, became chief of staff for U.S. forces in Europe. In 1943, he was made commander of amphibious forces of the U.S. Atlantic Fleet, and commanded the Western Naval Task Force in the invasion of Normandy, France, in 1944. He remained in Europe until the end of the war as commander of the U.S. naval forces in France, becoming a vice admiral in 1945. In 1946, he retired from the Navy with the rank of admiral. He served as U.S. Ambassador to Beligum (1946) and to the U.S.S.R. (1949-52). His wife, Lydia, wrote about life in Moscow in "Postmarked Moscow" (1952).

Kirk, NORMAN THOMAS, surgeon general of the U.S. Army, born in Rising Sun, Md., Jan. 3, 1888; died in Washington, D.C., Aug. 13, 1960. He was graduated from the Univ. of Maryland (1910) and from the Army Medical School (1913). He was chief of surgical services at Letterman (1936-41) and Walter Reed (1941-42) general hospitals. With the rank of major general, he was surgeon general of the U.S. Army (1943-47), in command of the Army medical services. He retired from the Army in 1947.

Kirksville (*kûrks'vĭl*), a city in northern Missouri, seat of Adair County, *ca.* 205 m. N.W. of St. Louis, on the Chicago, Burlington & Quincy R.R. The Wabash System provides freight service; and Kirksville Municipal Airport is 7 m. S.E. of the city. The city is the seat of the Kirksville Coll. of Osteopathy and Surgery; the home of its founder, Andrew T. Still (*q.v.*), has been preserved. Primarily a trade center, Kirksville manufactures clothing and appliances. The area produces livestock, corn, soybeans, and dairy products. Settled in 1841, the city was incorporated in 1857. Population, 1950, 11,110; in 1960, 13,123.

Kirkwood (*kĕrk'wŏŏd*), SAMUEL JORDAN, U.S. Senator, born in Harford County, Maryland, Dec. 20, 1813; died in Iowa City, Sept. 1, 1894. In 1835 he settled in Ohio, where he studied law, and in 1843 was admitted to the bar. In 1855 he settled in Iowa, where he served in the state senate, and in 1859 was elected governor as a Republican. He was re-elected governor in 1861, in which capacity he supervised the enlistment of 50 regiments of cavalry and infantry, and in 1866 became U.S. Senator. In 1875 he was elected governor of Iowa a third time, to fill the unexpired term of James Harlan, and in 1876 was again elected to the senate. He resigned his seat in the senate in 1881 to enter the Cabinet of President Garfield as Secretary of the Interior.

Kirschner (*kĕrsh'nĕr*), LOLA, novelist, born in Prague, Bohemia, in 1854. She is generally

known under her pseudonym, Ossip Schubin, and takes high rank as a writer of Austria. Her parents instructed her privately at their estate near Lochkov, and afterward she studied in Brussels and Rome. Her works include: "Among Ourselves," "The Broken Wing," "O, You, My Austria," "Uncommon Stories," and "Hail, You in Victor's Wreath." She died in 1934.

Kishinev (*ḳē-shē-nyōf'*), or CHISINAU, a city of Russia, capital of the government of Bessarabia, 85 m. N.W. of Odessa. It is located on the Byk, an affluent of the Dniester, and is at the junction of several railways. The chief buildings include a public library, two secondary schools, and several large Greek churches. It is important as a market for cereals and livestock and has manufactures of tobacco, clothing, and machinery. The inhabitants consist of Russians, Jews, Bulgars, Tartars, and Moldavians. Kishinev was under the Turks during the 16th century, but in 1770 it was captured by the Russians. In 1905 and 1906 it was the scene of severe persecutions of the Jews. The Treaty of Versailles (1919), after World War I, awarded the city to Rumania. In June 1940, however, Russia secured its restoration. During World War II, it was occupied by the German Army in July 1941, but in 1944 it was regained by Russia. Population, over 115,000.

Kiska (*ḳĭs'ḳȧ*), third most westerly island in the Aleutian archipelago. It is about 231 sq. m. in area and has the second best harbor in the Aleutian group. The island is probably volcanic in origin, has craggy, wind-worn coasts and rocky terrain. Except for a few stumps and shrubbery, the island is treeless, and there are no large mammals. The archipelago teems with birds, however, and the surrounding waters are rich in seal, sea otters, and other cold water sea-life. The weather is usually foggy and stormy.

The Aleutians formerly belonged to Russia, but fell to America with the purchase of Alaska. Kiska was occupied by the Japanese early in World War II, thus making it impossible for the U.S. Navy to proceed with plans to develop the fine harbor there as an advance base for operations in the northwest Pacific and the Bering Sea. Japanese occupation also prevented development of Kiska airfields from which reconnaissance could be maintained over the northernmost Japanese islands (southern Sakhalin and the Kurile group).

The U.S. re-occupied Kiska on Aug. 15, 1943, and found the island deserted. However, the occupying forces did find quartermaster warehouses bulging with clothing, food, fruit, ammunition, and some big guns.

The recapture of Kiska was a triumph for naval bombardment, U.S. airpower, and U.S. amphibious forces, and above all a triumph of strategy. It gave the U.S. an unbroken string of bases toward the Kuriles, and was a vital stepping stone on the road to Japan, beyond the Kuriles. With the re-conquest of Kiska, the complete Aleutian fold came into American hands once more and now forms an important key in western hemisphere defense. Population, less than 1,000.

Kislew (*ḳĭs'lū*), the third month in the Jewish calendar, having 29 days, or 30 in a leap year. It corresponds to about early November through early December in the Gregorian calendar.

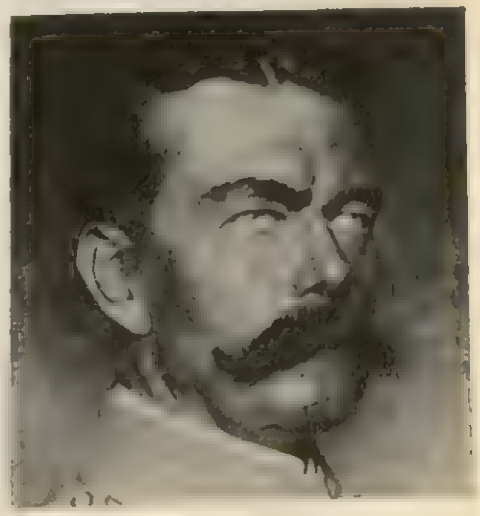
Kismet (*ḳĭs'mĕt*), Arabian word, signifying the principle of Mohammedan philosophy, which teaches that fate inescapably rules the destiny of each individual and that one must submit with faithful humility.

Kitchen Cabinet (*ḳĭch'ĕn ăb'ĭ-nĕt*), the name applied in American politics to a group of men during the administration of Andrew Jackson. These men were supposed to influence the action of the President more than the members of the cabinet, though they were not important as government officials. Those who were included with these unofficial advisers were William B. Lewis, Duff Green, Isaac Hill, Amos Kendall, and Francis P. Blair, Sr., editor of the Washington *Globe*.

Kitchener (*ḳĭch'ẹn-ẽr*), the county seat of Waterloo County, Ontario, on the Grand River and the Canadian National and the Canadian Pacific Rys., about 60 m. w. of Toronto. It is in a fertile region and has manufactures of butter, clothing, machinery, and merchandise. Formerly called Berlin, the name was changed to Kitchener in 1916. Population, *ca.* 31,000.

Kitchener, HORATIO HERBERT, general, born in Gunsborough Villa, Ireland, June 24, 1850; died June 5, 1916. His father, Henry Horatio Kitchener, was lieutenant colonel in the English

HORATIO HERBERT KITCHENER



army. He was educated at the Royal Military Acad., Woolwich, and in 1871 entered the army as a lieutenant of royal engineers. The same year he enlisted under French colors and participated in the Battle of Le Mans, where the French army under Gen. Chanzy was defeated by the Germans under Prince Frederick Charles. In 1886 he was appointed pasha in the native army of Egypt and governor of Suakin, which position he held until 1888. when he attained to the rank of colonel in the British army. He was made commander of the Egyptian forces in 1892, leading a successful campaign against the Dervishes, who were finally defeated in the Battles of Omdurman and Khartum. Soon after he returned to England and was given a vote of thanks by both houses of Parliament and a grant of $150,000. In 1899 he became governor general of the Sudan. In 1900 he was made commander-in-chief in the Boer War in South Africa, which position he held until peace was declared, in 1902, when he was given chief command in India. At the beginning of World War I, in 1914, he was put in charge of the work of organizing the British campaign. He was drowned while on a mission to Russia, off the Orkney Islands, where the steamship *Hampshire* was sunk by a mine on June 5, 1916.

Kitchen-Midden (*kĭch'ĕn-mĭd'n*), a stage in the cultural development of prehistoric man, also referred to as "shell-mound culture," because of the mounds of this period discovered near the coasts of South Scandinavia and the Baltic Sea. Similar mounds of seashells and bones have been excavated along the Pacific coast, the Delaware River Valley, and in Florida. All indications point to the existence of such a cultural stage in the Late Paleolithic or early Mesolithic Period. Bone and stone implements were known as well as pottery.

Kite (*kīt*), the common name of many birds of prey. They belong to the falcon family, but differ from the true falcons in having shorter legs and longer wings. The wings are pointed, the tail is deeply forked, and the flight is easy and graceful. The *swallow-tailed kite* is common to the southern parts of the U.S. It has glossy black feathers on the back and wings and the lower part is white.

Kite, a contrivance formerly used only as a toy, but now employed for various economic and scientific purposes. It is constructed of a light framework, covered with paper or cloth, and is raised into the air by the wind acting upon it. The effect of the wind upon a kite is similar to that upon a sail, and depends upon the contrivance being held by a string in a way that the wind will be effective in lifting it. Kites are used in weather observations, communicating between stranded ships, and determining the temperature in the clouds. Benjamin Franklin made electrical experiments by using the kite. The forms used for amusement usually have a tail, which gives steadiness to the kite in sudden flurries of wind.

Kittredge (*kĭt'rĕdj*), GEORGE LYMAN, educator and scholar, born in Boston, Mass., Feb. 28, 1860; died in Barnstable, July 23, 1941. When Kittredge matriculated at Harvard, he entered upon a life-long association with that university. Four years after his graduation (1882) he joined the faculty of the department of English, becoming a full professor in 1894 and continuing in that capacity until his retirement in 1936. He became famous for the power and lucidity of his teaching and for the authority and broad scope of his scholarship. He was the author of definitive books on Chaucer (1894 and 1915), Shakespeare (1916 and 1936), witchcraft in England and New England (1912 and 1929), and many other fields of English literature. He was editor of "The Albion Series of Anglo-Saxon and Middle English Poetry" (with J.W. Bright, five volumes, 1900-07) and a distinguished "Complete Works of Shakespeare" (1936), and advisor and revision editor of "Webster's New International Dictionary."

Kitty Hawk (*kĭt'ê hąk*), a village of Dare County, North Carolina, on Albemarle Sound. Four miles south of here, the Wright brothers, Wilbur and Orville, made their first successful airplane flight from Kill Devil Hill, Dec. 17, 1903. The Kill Devil Hill Monument is now a national memorial. Population, *ca.* 250.

Kiwanis International (*kĭ-wä'nĭs*), a service organization of business and professional men, founded at Detroit, Mich., in January 1915 and composed of local Kiwanis clubs throughout the U.S., Canada, and other parts of the world. The local clubs hold weekly meetings and carry on activities in the fields of public affairs, rural-urban relations, church support, vocational guidance, and business standards. Each club sends two delegates to the annual convention of Kiwanis International. There are about 260,000 members in almost 5,000 clubs. Headquarters are in Chicago, Ill.

Kiwi (*kē'wī*), or APTERIX, Greek meaning without wings, a genus of birds, inhabitants of New Zealand. Though they have rudimentary stumps of wings, they cannot fly; they avoid their enemies by their rapidity in running. Usually the size of a large hen, they are sometimes over 2 ft. high. During the day they hide in holes in the earth and come out at twilight. The natives derive the name "kiwi" from the sound of the bird's cry.

Klamath (*klăm'ąth*), a river that rises in southern Oregon in Lake Ewauna at the tip of Upper Klamath Lake. It flows southwest across the northwestern extremity of California, mainly

through deep and narrow canyons, on its way to the Pacific Ocean. The mouth of the Klamath is located about 20 m. s. of Crescent City, Calif. It is between 250 m. and 275 m. long.

Klamath, an Indian tribe in southwestern Oregon. It comprises one branch of the Lituamian linguistic family, the other being the Modoc. The main Klamath settlements were on Upper Klamath Lake, but there also were important ones along the Williamson and Sprague rivers. They are a hardy people and have always lived at peace with the whites. They joined the Modocs in 1864 in ceding the greater part of their territory to the U.S. and settled on the Klamath Reservation. Prior to the signing of the treaty, the Klamaths joined the Modocs in annual raids on the Indians of Pit River to obtain slaves, which they either kept for themselves or traded to the Chinooks of the Columbia River. There were 1,819 Klamaths on the tribal roll in 1950. Their chief sources of income are agriculture, timber on allotted lands, leases on allotted lands, and game and furs.

Klausenburg (*klou'zẹn-bōōrk*), German name of CLUJ (Hungarian, Kolozsvár), city in Rumania, *ca.* 82 m. s.e. of Oradea in Transylvania province. Industries include leather, metal, and textile factories. There are a 15th-century Gothic church, an agricultural academy, and two universities. Founded in 1178 by German colonists, the town became part of Rumania in 1920. Population, 1948, 117,915.

Kléber (*klā'bâr*), JEAN BAPTISTE, soldier, born in Strasbourg, France, March 9, 1753; died in Cairo, Egypt, June 14, 1800. Having served as an officer in the Austrian army, he became a general in the French revolutionary army. He took part in the battle of Fleurus and the siege of Mainz (1794-95), defeated the Austrians at Altenkirchen (1796), and accompanied Napoleon to Egypt (1798). Chief commander in Egypt after the return of Napoleon to France, he gained a victory over the Turks at Heliopolis in 1800, but was murdered by an Egyptian fanatic.

Kleist (*klīst*), HEINRICH VON, poet, dramatist, and novelist, born in Frankfort-on-the-Oder, Prussia, Oct. 18, 1777; died (a suicide) near Potsdam, Nov. 21, 1811. He served with distinction in the Prussian army against the French revolutionary army but resigned in 1799. He studied at the university in his home town and later traveled. He became interested in literature, but he led a restless and unhappy life. He is considered one of the most important German romanticists, and *"Der Prinz von Homburg"* (1821) is one of his frequently performed plays. "Michael Kohlhaas" (1808; Eng. trans., 1949) is a well-known novel.

Kleptomania (*klĕp-tō-mā'nĭ-ạ*), a mental disease, believed by psychiatrists to be of emotional origin, in which is displayed an irresistible desire or propensity to steal and hoard. The symptoms usually consist of peculiar motives for stealing and hoarding, peculiar judgment as to the character of the commodities taken, and a characteristic interest in many articles of little value.

Klondike (*klŏn'dīk*), a small tributary of the Yukon River, which has a general course toward the west, and flows into the Yukon near Dawson, Yukon, Can. Valuable deposits of gold were discovered in the region by George Carmack, a native of Illinois, in August 1896. The Klondike region (or district), famous for the gold rush of 1897-98, is situated just across the border of Alaska, which was crossed by many thousands of prospectors and fortune seekers. The precious metal, in this region, occurred largely in a free state in the form of nuggets and grains, being separated from the gravel and dirt by washing. By 1900 the annual output amounted to *ca.* $22,000,000, but it then declined rapidly to negligible proportions ten years later.

Klopstock (*klŏp'shtŏk*), FRIEDRICH GOTTLIEB, poet and prose writer, born in Quedlinburg, Germany, July 2, 1724; died in Hamburg, March 14, 1803. He was the son of a lawyer and studied at the classical school of Schulpforta and later the universities of Jena and Leipzig. In 1746 he began to contribute articles to periodicals, and the first part of his epic *"Der Messias"* ("The Messiah") appeared in the *Bremer Beiträge* (1748). He then traveled, accepting stipends that were offered to him. In 1754 he married Margareta Moller, who died four years later and whose writings he published (1759) under the title *"Hinterlassene Werke von Margareta Klopstock."* Her death caused him great suffering. He met Goethe in 1775 and then settled in Hamburg, where he spent almost all his remaining years.

Klopstock was probably at his best in the lyrical poetry of his odes, but his great work was *"Der Messias,"* written over a period of 25 years. The epic aroused much interest, and it was much imitated and widely translated. The complete work, however, proved uneven, chiefly because the epic form and the religious subject were not particularly well suited to each other. Klopstock also made contributions to philology and the history of German poetry. He exerted great influence on German thought and literature, favoring political unity and helping to counteract French tendencies in the literary and social life of Germany. Other works are the drama *"Der Tod Adams"* (1757) and *"Hermannsschlacht"* (1769).

Klosterneuburg (*klō'stĕr-noi'bōōrk*), a town in Lower Austria, situated on the Danube River, 17 m. N.W. of Vienna. The town produces chemicals, and there is a school of horticulture. Klosterneuburg, however, is famous for its Augustinian cloister (founded in the 12th century).

The monastery contains a valuable library, including many illuminated manuscripts, and many priceless works of art.

Klystron (*klī'strŏn*), a special vacuum tube used in radar to produce a beam of ultra-high-frequency (*q.v.*) waves. The klystron tube's operation is based on two principles: Electric oscillations can occur in hollow cavities by the movement of electrons back and forth on the inner surface of the chamber. These oscillations can be produced in the chamber by sending through it a focused beam of electrons which are bunched together. In application, the grouping of waves is obtained by connecting an electrode to the resonating chamber just far enough away so that the alternating voltage on the electrode speeds up and retards the electrons in the beam, which then pass into the resonance chamber, where their motion is intensified. In order to send out these high-frequency oscillations an antenna is placed at the focus of a parabolic radiator or "mirror," which gives intense parallel beams of radiation. These high-frequency focused waves following each other in close succession give the effect of a continuous beam but a sufficient time-lapse exists between pulses so that the returning, reflected wave can be registered by the radar receiving apparatus. See *Radar*.

Knapweed (*năp'wēd*), also called bullweed, weed common in Europe and naturalized in the U.S. in pastures and meadows. It has purple flowers.

Kneipp (*knīp*), SEBASTIAN, priest and inventor of a special water cure, born in Stefansried, Germany, in 1821; died June 17, 1897. While studying for priesthood, he became interested in the use of water in curing diseases. He developed a treatment involving a routine of water, fresh air, sunshine, and regular activities. Many establishments in leading cities of the world, including some in Canada and the U.S., offered the treatment which more recently has begun to lose favor with doctors and patients alike. Kneipp wrote "My Water Cure," "So Shall You Live," and "The Treatment of Children in Health and Disease."

Knickerbocker History (*nĭk'ĕr-bŏk-ĕr hĭs'-tô-rĭ*), title of a farcical history of New York, written by Washington Irving (*q.v.*) under the pseudonym of Diedrich Knickerbocker, 1809. This work deals in broad burlesque with the early Dutch settlers of New York (New Amsterdam). From its title it derived the name "Father Knickerbocker," designating Manhattan.

Knife (*nīf*). See *Cutlery*.

Knight (*nīt*), ERIC MOWBRAY, writer, born in Menston, Yorkshire, England, Apr. 10, 1897; died 1943. He came to the U.S. in 1912 and received an education at the Boston Museum of Fine Arts and the New York School of Design. He served with the Canadian Army during World War I and subsequently made his home in Pennsylvania, where he devoted himself to a literary career, becoming widely known as a novelist and contributor to magazines. Among the most popular of his books were: "The Flying Yorkshireman" (1938), "The Happy Land" (1940), "Lassie Come Home" (1940), and "This Above All" (1941). He became a naturalized citizen of the U.S. in 1942 and was commissioned a major in the U.S. Army. His death in an airplane crash while on an official mission cut short a literary career of unusual promise.

Knighthood (*nīt'hŏŏd*), ORDERS OF, a term applied to organized and constituted orders or bodies of knights. Two classes of orders of knighthood are generally recognized, one constituting fraternal associations and the other honorary. The associations or fraternities possess property as independent bodies, to which class belong the Hospitalers, Templars, and Teutonic Knights. Honorary associations were established by sovereigns within their own dominions and embrace most of the orders now maintained in European countries, such as the orders of St. George, Golden Fleece, St. Michael, and Holy Ghost. The orders of the Garter, St. Patrick, the Thistle, St. George, and several others are British. The Star of India is an order of India. Each order of knighthood in the different countries has appropriate insignia, with which is included a badge, ribbon, collar, jewel, and star. The Normans first introduced knighthood into England as a feudal institution, but at present a knight holds a title of honor next below a baronet. Since the 16th century it has been considered a title of honor conferred as a reward for personal merit or for service rendered the crown or the country. The title carries with it the right to prefix *sir* to the Christian name and the wife is legally called *dame*, though *lady* is by courtesy her designation. Knights who belong to no special order of knighthood are properly knights bachelor. Those belonging to an order take the name of such order, as knight of the Garter and knight of the Bath. The rank is not hereditary. See *Chivalry*.

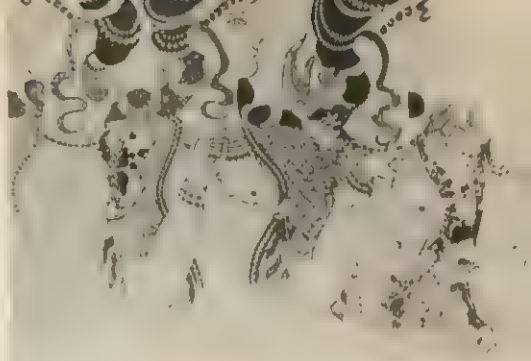
Knights of Columbus (*nītz ŏv kŏl-lŭm'-bŭs*), a fraternal benefit association, founded (1882) for Catholic men by Rev. Michael J. McGivney and nine parishioners of St. Mary's R. C. Church in New Haven, Conn., where the national headquarters of the society were subsequently located. The total membership in 1953 was 870,726 in 3,261 local councils of the order throughout the U.S., Canada, Mexico, and Cuba. The society publishes the monthly magazine, *Columbia*, and a *Weekly News*.

Knights of Pythias (*pĭth'ĭ-ăs*), a fraternal association founded in Washington, D.C., in 1864, to "promote friendship, charity, and benevolence."

The society takes its name from the ancient Pythagorean of Syracuse, Pythias, whose friendship for Damon (*q.v.*) is one of the celebrated legends of classical literature. Condemned to death by Dionysus the Elder, Pythias was permitted to visit his family once more before his execution, on the condition that Damon take his place in suffering the penalty should he fail to return. When Pythias appeared before the time set for the execution, Dionysus was so impressed by the loyalty of the two friends that he set them both free. In 1953 the total membership of the order approximated 300,000 in *ca.* 2,800 lodges in the U.S., Canada, Hawaii, and Alaska.

Knights of the Golden Circle (*gōl'dĕn sûr'k'l*), a secret society of the U.S., organized in 1855 to advance the slave-holding interests of the South. The original purpose was to found a government in the vicinity of the Gulf of Mexico, which was to be the seat of vast slave-holding plantations. As a means to further organization, numerous lodges, or *castles,* were maintained. The members of this organization were not only numerous in the South, but were represented very extensively in the North. They had not less than 40,000 members in Indiana and a corresponding number in many other states. In the Presidential campaign of 1860 they were a factor in defeating the Democratic party, as they supported the Southern wing instead of Stephen A. Douglas.

Knitting (*nĭt'ĭng*), the art of weaving a single thread so as to form a kind of fabric. It is done by means of knitting needles, usually of ivory or steel, which are made of various sizes to suit the fineness of thread used. Formerly the work of knitting was done wholly by hand, but the larger part of knit goods is now made with knitting machines. The first knitter was invented in 1589 by William Lee of England, but many improvements have been introduced to make these machines highly utilitarian. Those in general use are rotary or circular in form, fitted to produce a circular web. They have a circular series of vertical parallel needles that slide in grooves in a cylinder, and are raised and lowered successfully by an external rotating cylinder which has cams on the inner side that act upon the needles. A hook at the end of each needle serves to draw down the thread so as to form a loop as it is depressed. This loop is slipped off over the hook when the needles are again elevated, thus forming a part of the web as the next hook is joined to it. Within the circle is an opening for the web, which is held in position by a weight attached to the lower end of it. Modern knitting machinery has revolutionized the manufacture of knitted fabrics, such as hosiery and underwear.



MURAL FROM THE PALACE OF KNOSSOS

About 1500 B.C.

Knockout (*nŏk'out*), in boxing, a blow delivered by one contestant which renders the other unconscious, whereupon the referee, after a count of 10, automatically awards the contest to the boxer who "knocked out" his opponent. Hence, by popular application, any sensory impression which temporarily stuns the recipient, or any finishing stroke.

Knossos (*nŏs'ŭs*), in archeology, city and palace of the legendary King Minos of Crete. Knossos is the site of the *labyrinth,* probably the palace of the king himself. It was excavated by the English in the last decade of the 19th century and many remains of the Cretan-Minoan civilization were found (pottery, sculpture, etc.).

Knot (*nŏt*), a fastening or twisting together of the ends or parts of one or more threads or ropes, or the looping of such threads around some other object so as not to come apart easily. The art of tying knots is important on shipboard, and those in use among seamen require much skill in the adjustment. They include about 200 different kinds, but of this number only a comparatively few are in general use. These include the so-called reef knot, figure of eight knot, bowline knot, running bowline knot, rope-yarn knot, manrope knot, and Matthew Walker knot.

Knot Grass (*nŏt grăs*), a widely distributed herb with grasslike leaves and green flowers. The name is also applied to a tropical grass used in medicine.

Knot-Writing (*nŏt-rīt'ĭng*), also called *Quipus,* the method by which ancient South American Indian tribes recorded facts and dates. A long cord strung with colored strings was used, the colored strings being knotted at different places. It could be compared, although utilizing entirely different materials, with Assyrian cuneiform.

Knowles (*nōlz*), JAMES SHERIDAN, dramatist, born at Cork, Ireland, May 21, 1784; died Nov. 30, 1862. His family removed to London when he was eight years old. In 1806 he made his debut as an actor in Dublin and later taught elocution at Belfast and Glasgow. In the meantime he began to write short dramatic works.

These were published in 1843 under the title "Dramatic Works." He abandoned the stage in 1849 and subsequently became a minister in the Baptist denomination.

Know-Nothings (*nō-nŭth'ĭngz*), a name given to the members of the American party, which was organized in the U.S. in 1855. It was so called because the party was a secret organization and, when asked about its affairs, the members professed to know nothing about them. Among its tenets were that naturalization should be granted only after 21 years' residence, that America should be governed only by Americans, and that allegiance to any foreign power should constitute a bar to selection for office. The party was organized for an active campaign in 1855, when it carried the state elections of Kentucky, New York, California, and most of New England. Millard Fillmore was its candidate for President in 1856 and received 874,534 votes, but in the electoral college obtained only eight votes, those cast by the state of Maryland. After the election of 1856 the party became disorganized and most of its members went over to the newly organized Republican party.

Knox (*nŏks*), FRANK (WILLIAM FRANKLIN), newspaper publisher and politician, born in Boston, Mass., Jan. 1, 1874; died Apr. 28, 1944. He began his career as a journalist in the successive capacities of reporter, city editor, and circulation manager of the *Grand Rapids* (Mich.) *Herald*. By 1901 Knox had acquired the first of a long list of newspapers, which came to include the *Chicago Daily News* and the *Boston American*.

He served in the Spanish-American War among Theodore Roosevelt's famous "Rough Riders," and in World War I. He was general manager of the Hearst newspapers until 1931. In 1936 he was Republican nominee for Vice President of the U.S. Despite political differences, he was appointed (1940) Secretary of the Navy in the cabinet of Democratic President F.D. Roosevelt.

FRANK KNOX

Knox, HENRY, soldier and patriot, born in Boston, Mass., July 25, 1750; died at Thomaston, Me., Oct. 25, 1806. At the age of 18 years he began to train in a company of grenadiers, by whom he was chosen commander. His education was secured in a common school, after which he engaged as a bookseller, but his military ardor soon led him to join the army. He fought in the Battles of Bunker Hill, Trenton, Brandywine, Germantown, and Monmouth, and during the siege of Yorktown. His earnestness won the special confidence and esteem of Washington. He was appointed Secretary of War in 1775 and, when Washington became President, he again secured an appointment to the same position. In 1794 he withdrew from public life and retired highly honored to a homestead on the Penobscot in Maine. Subsequently he was chosen a member of the state legislature.

Knox, JOHN, great Scottish Protestant reformer, born (probably) at Giffordgate near Haddington in Scotland, sometime between 1505 and 1515; died Nov. 24, 1572. Little is known about his early life. He seems to have studied theology in Glasgow and St. Andrews, and was ordained as priest in the Roman Catholic Church. We first learn of his Protestant leanings at the end of 1545 when he struck up a friendship with George Wishart, who was burnt the following year in St. Andrews because of his professed Protestant faith. Knox fled from St. Andrews after Wishart's execution, but returned following the death of Cardinal Beaton in 1547. The Castle of St. Andrews had meanwhile become a Protestant stronghold and it was here that John Knox really became a minister of the new faith, having up to that time sought his vocation in teaching rather than in preaching.

In a century of intense religious strife, the old rivalry between France and England inevitably expressed itself in religious differentiation, from which England emerged as the major Protestant, and France as the major Catholic, power. Scotland at first sought the preservation of her independence through an alliance with France, sending Mary Stuart, Queen of Scots, to the French Court to be educated there and to marry later the Dauphin of France, Francis II—instead of promising her to Edward VI, the son of Henry VIII who wanted to unite England and Scotland under the English Crown.

In pursuance of the policy of Scottish independence, French troops seized the Castle of St. Andrews, confining Knox and some other Protestants to the galleys. After 19 months of terrible sufferings, he was released (1549) and lived for

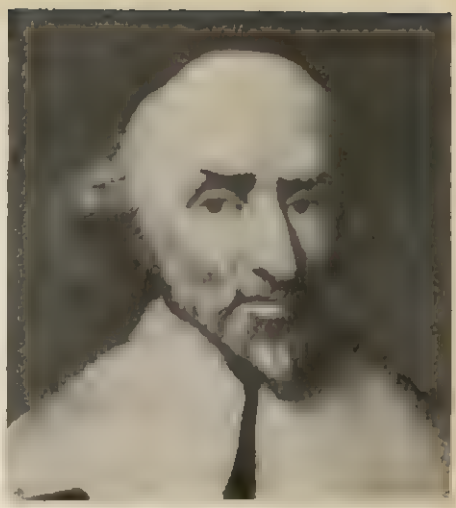
the following five years in England, receiving an appointment as preacher in the Reformed faith in Berwick and Newcastle. He apparently also became one of the chaplains to the king, Edward VI, and after Edward's death—followed by the ascension of Mary I, who tried to restore Catholicism—Knox escaped to the Continent (1554). He went to Dieppe, then to Geneva, where he accepted a call to the pastorate of the English Church in Frankfort.

Violent dissensions in his congregation forced him to return from Frankfort to Geneva the following year, and in August 1555 he set out to visit Scotland again. There he preached with great success, and gained such powerful support among the Scottish nobles that the ecclesiastical court which summoned him to Edinburgh in May 1556 did not dare to prosecute him. However, after Knox left Scotland again for Geneva in July 1556, he was summoned once more, condemned in absentia, and burned in effigy. His answer to this was the publication of his "Appellation" from Geneva.

Except for a few months spent in Dieppe (1557-58), he remained the following three years in Geneva, learning Greek and Hebrew, cooperating in the translation of the English Bible, officiating at the English Reformed Church, and writing books, among others the "First Blast Against the Monstrous Regiment of Women." Knox remained in constant contact with the Reformed party in Scotland, advising their leaders and directing their activities through a steady and voluminous correspondence.

In 1559 Knox returned to Scotland where his party had meanwhile gained considerable strength, especially after the leaders of the Protestant communities had formed religious bonds or "covenants" as the "Lords of the Congregation." Although Mary of Lorraine as regent for her daughter Mary Stuart (who was still in France) had forbidden Protestant preaching, Knox preached in Perth, St. Andrews and other towns of Central Scotland, arousing such high feelings that outbreaks arose, especially in Perth where a mob sacked a church and several cloisters. Open war broke out. The old Church, defended by the regent in alliance with the French, fought against the Lords of the Congregation inspired by Knox. The French troops were superior, and won initial victories, but the Lords followed Knox's advice and sought an alliance with England, achieved in January 1560.

The French were forced to surrender, after French help had failed to arrive and Queen Elizabeth of England had sent money and troops. The regent died in June 1560, and one month later Lord Cecil made a treaty for Elizabeth with the French plenipotentiaries representing Francis II and his wife, Mary Stuart, according to which the



JOHN KNOX

French troops had to leave Scotland and a General Assembly had to decide the religious question. Consequently, in August 1560, Catholicism in Scotland was not only abolished, but even exposed to persecution, and the Reformed Church, based on Calvinist concepts, was established as the official national "Kirk" of Scotland. Knox, together with five other ministers, wrote the "Confession of Faith" and the "First Book of Discipline," which contained the constitution of the new church. He became minister at St. Giles in Edinburgh and began to write his best-known work "The History of the Reformation in Scotland" (1560).

In 1561 Mary Queen of Scots returned from France and had several interviews with Knox, but failed to produce a better understanding between the participants. Knox seems to have been unduly rude and was certainly intolerant. Mary, though remaining a Catholic, had from the beginning shown a favorable and conciliatory attitude towards Protestantism and had not rescinded any of its newly won liberties, but she insisted on having Mass said privately. Knox took great offense at this, and Mary later brought a charge of treason against him, but no serious action was taken. The real issue of contention lay in the possibility of a second marriage of the queen with a powerful Catholic prince, in which case the cause of Protestantism in Scotland would have been lost.

When Mary married (1565) her cousin Henry Darnley, a Catholic, she did not change the religious status of her country. After the murder of the queen's secretary, Rizzio, Knox made known his opinions concerning the turbulent affairs of the royal household and was forbidden to preach when the court was in Edinburgh (1566).

While Knox was on a lengthy visit to England, Darnley was murdered by Bothwell, whom

the queen subsequently married, and Knox returned in 1567 to oust Mary from the throne through his leadership in the General Assembly. She was forced to abdicate in favor of her son James (still a baby) under the regentship of her half brother, the Earl of Moray, a Protestant. Moray, who had been friendly to Knox, was murdered in 1570 and in the ensuing civil strife Knox was compelled to leave Edinburgh and go to St. Andrews. He returned to Edinburgh in 1572 and died there, leaving a widow, Margaret Stewart, with three daughters of her own and two sons of his first wife, Marjorie Bowes.

Knox's indomitable will, his strong character, the sincerity of his convictions, and the tenacious courage with which he defended them, had a much deeper effect than that of making Scotland a Protestant country; they left the stamp of his personality on the Scottish national character through religious, educational, and even political organization.

Knox, PHILANDER CHASE, statesman, born in Brownsville, Pa., May 6, 1853; died in Washington, D.C., Oct. 12, 1921. He was graduated (1872) from Mt. Union Coll., Alliance, Ohio. During his college years he formed a lasting friendship with William McKinley, then a county district attorney. Knox was appointed (1876) an assistant Federal district attorney and the following year became a partner in a Pittsburgh law firm. He served as Attorney General (1901-04) under President McKinley, as a U.S. Senator (1904-09), and as Secretary of State (1909-13) under President Taft. In 1913 Knox returned to the practice of law and in 1916 was reelected to the Senate, where he led (with Sen. Henry Cabot Lodge, *q.v.*) the opposition to the League of Nations and proposed the original resolution for a separate peace treaty with Germany and Austria after World War I.

Knoxville (*nŏk'vĭl*), a city in Tennessee, seat of Knox County, on the Tennessee River, 114 m. N.E. of Chattanooga, Tenn. It is served by the Southern and the Louisville & Nashville R.R.'s. The city is in the eastern part of the state, 25 m. N.E. of Great Smoky Mts. National Park and 20 m. E. of Oak Ridge (*q.v.*). The Tennessee Valley Authority (*q.v.*) has its headquarters here.

Situated in the center of a region that produces coal, zinc, and marble, Knoxville is an industrial city. Its manufactures include textiles, foods, apparel, steel and iron, and stone, glass, clay, and tobacco products. It is the center of a standard metropolitan statistical area (pop., 1960, 368,080) which includes Anderson, Knox, and Blount counties. In 1958 the city of Knoxville alone produced a value added by manufacture of $115,181,000.

The city's more than 40 public elementary and secondary schools enroll *ca.* 22,500 pupils annually. The institutions of higher learning include the Univ. of Tennessee and Knoxville Coll. The Tennessee School for the Deaf is also located in Knoxville.

Knoxville was settled in 1786 and was first known as White's Fort; in 1791 it was laid out and renamed Knoxville for Maj. Gen. Henry Knox (*q.v.*). It was the capital of the Territory South of the River Ohio from 1792 to 1796, state capital from 1796 to 1812, and was incorporated as a city in 1815. During the Civil War the city supported the Union, and it was occupied by Confederate troops until it was taken in 1863 by a Union army under Gen. Ambrose Burnside. Confederate troops under Gen. James Longstreet laid siege in an effort to regain control but were forced to withdraw when Gen. William T. Sherman's army arrived to relieve Burnside.

In 1890 Knoxville had a population of 22,535. Its decade of greatest growth saw an increase from 36,346 in 1910 to 77,818 in 1920. In 1950 the population was 124,769; in 1960 the figure was 111,827.

Knudsen (*nōōd's'n*), WILLIAM S., industrialist, born in Copenhagen, Denmark, March 25, 1879; died in Detroit, Mich., April 27, 1948. He came to the U.S. at the age of 20 and held various jobs until he joined the Ford Motor Co., where he gradually rose to be a production manager. In 1922 he became vice president of the Chevrolet Motor Co., of which he later was named president. He was executive vice president of General Motors Corp. from 1933 to 1937, when he became president. In 1940 he was appointed a member of the National Defense Commission and was named codirector of the Office of Production Management in 1941. In 1942 he became director of production for the War Dept., with the rank of lieutenant general. In July 1945 he returned to General Motors Corp. as a member of the board of directors.

Koala (*kō-ä'lä*), a bearlike marsupial, native to Australia, a member of the phalanger family, which is closely related to the kangaroo family. The koala is 2 ft. to 2½ ft. in height and is heavily furred, with large, squared ears. Its coat has a grayish color, shading to yellowish white on the hindquarters and white on the underparts. It dwells largely in trees, having sharp-clawed feet that enable it to climb well, and is nocturnal, sleeping much of the day and feeding at night on eucalyptus leaves. The koala differs from other members of its family by the absence of a tail. The female carries its young (one to a litter) in an abdominal pouch for about six months, and a koala is not fully grown before the age of six. The koala is defenseless and was ruthlessly hunted for many years until laws were passed to protect it from extinction.

Courtesy Australian News & Info. Bureau, N. Y.

KOALA

Kobe (*kō'bā*), a seaport city of Japan, in the southern part of the island of Honshu, on the Bay of Osaka. It has a safe and large harbor, extensive shipyards, and large railway shops. Kobe has direct steamship communications with the leading ports of the world. Paper, clothing, sake, pottery, and machinery are among the chief manufactures. Before World War II, Kobe had an extensive commerce with Great Britain, Germany, France, and the U.S. In 1935 the grand total value of exports and imports was 1,732,540,000 yen, with an excess of 89,258,000 yen of imports over exports. In the same year, about 105,000 foreign vessels entered Kobe harbor, and it ranked second only to London in its revenue from bill-of-lading freight.

During the final phase of World War II, Kobe was bombed twice. In June 1945, 3,000 tons of fire bombs were dropped on the city by several hundred American Superfortresses; in early August, a few days before the Japanese surrender, planes based on Iwo Island attacked the Nagoya-Kobe area. Population, 1940, 967,234.

Koch (*kôk*), ROBERT, physician and bacteriologist, born in Klausthal, Germany, Dec. 11, 1843; died at Baden-Baden, May 28, 1910. He received a medical degree from the Univ. of Göttingen, and entered practice in a town near Hanover, later moving to Wollstein. He isolated the bacillus of anthrax in 1876, and in 1883 announced a means of preventive inoculation against anthrax. He became a member of the sanitary commission at Berlin in 1880 and a professor at the school of medicine there in 1885. His discovery of the bacillus of tuberculosis was made public in 1882. Sent by the German government to Egypt and India in 1883 to study the causes and prevention of Asiatic cholera, he identified the comma bacillus, or *Vibrio comma*, as the cause. On returning to Germany, he became a privy councilor and director of the Imperial Inst. of Hygiene. His announcement (1890) that tuberculin was a probable remedy for tuberculosis proved overoptimistic, although tuberculin became useful for diagnosing the disease in milk cows and food animals, and later also in persons. Malaria, sleeping sickness, bubonic plague, and rinderpest were among the other diseases studied by Koch. The Nobel Prize for physiology and medicine was awarded to him in 1905.

Kocher (*kōk'ĕr*), EMIL THEODOR, surgeon, born in Berne, Switzerland, Aug. 25, 1841; died July 27, 1917. He received his medical degree in 1865 and joined the faculty of the Univ. of Berne, where he remained (1872-1911) as professor of surgery and chief of the surgical clinic until his retirement. Kocher was one of the foremost surgeons of his day. His achievements included the development of a method for setting shoulder dislocations, now known as the Kocher maneuver, the development of operations for conditions such as hernia and cancer of the stomach and tongue, and, his most famous achievement, the development of an operation for the removal of the thyroid gland. In 1909 Kocher was awarded the Nobel Prize for medicine and physiology, the first surgeon to receive this award.

Courtesy Brown Bros., N. Y.

ROBERT KOCH

Kodaly (*kō-dä'lĭ*), ZOLTÁN, composer, born in Kecskemét, Hungary, Dec. 16, 1882. Kodaly

studied at the Univ. of Budapest and at the Budapest Acad. under Hans Koessler; since 1907 he has been a professor at the academy. He has made exhaustive studies of the folk music of Hungary and has published reports on his research and on his collection of over 3500 folk melodies. As a composer, he is noted for his contemporary adaptations of colorful folk themes, for his skillful orchestrations, and for his ultramodern harmonic technique. Among his best-known works are his comic folk opera, "Háry János" (1926), *"Psalmus Hungaricus"* (55th Psalm), and many songs and choral selections.

Kodiak (*kō'dĭ-ăk*), largest island of Alaska, at the mouth of Cook Inlet, across Shelikof Strait from the mainland. It is *ca.* 100 m. long and 60 m. wide, with an area of 3,465 sq. m. Much of the surface is rugged; the coast is rocky and steep, broken by inlets. The chief industries are fishing and canning (particularly salmon) and fur trapping. The town of Kodiak (pop. 1950, 1,710), at the western end of the island, was incorporated in 1940. It is a shipping center for furs and fish and the site of naval and air bases. The first Russian settlement on the island, Three Saints Bay, was moved (1792) to the site of Kodiak and was called St. Paul's Harbor. Population (largely Eskimo), 1950, 6,264.

Koenig (*kā-nĕg'*), JOSEPH MARIE PIERRE, soldier, born in Caen, France, Oct. 10, 1898. A major in the French army when France fell to the Germans in 1940, Koenig joined the Free French forces in North Africa. Promoted (1941) to brigadier general, he fought in the Libyan campaign. He became a major general (1943) and was delegate (1944) to the Committee of National Liberation for the Northern Theater of Operations. Koenig became (1944) military governor of Paris, and after the surrender of Germany (1945) he was French representative on the Allied Control Commission in Germany. He resigned from the army in 1951 and was elected to the National Assembly; he also served as a cabinet member.

Koestler (*kŭs'lĕr*), ARTHUR, writer, born in Budapest, Hungary, Sept. 5, 1905, of half Hungarian, half Austrian parents. After he had finished his education, he went to the Far East, Palestine and Egypt, where after holding many unimpressive jobs he finally became foreign correspondent for German newspapers, which later sent him to Russia, Paris, and Switzerland. Later, as correspondent for the London *News Chronicle,* he covered the Spanish civil war, was captured and sentenced to death by Gen. Franco's Nationalists, but was reprieved. A resident of France at the time, he escaped (1940) to England and fought with the British army in World War II. After the war, he again went to the Middle East. Out of his experience as journalist, he gradually de-

Courtesy Macmillan Co., N. Y.

ARTHUR KOESTLER

veloped into one of the most widely acclaimed writers of the century.

Koestler's work is outstanding for the author's gift of incorporating political and philosophical meaning into his novels. His characters are such well-developed literary figures that they live in their own right, independent of their opinions. In his books, Koestler is bitter and skeptical, but courageous and passionate in stating his case. The decisive experience of his life was his contact with Communism. At first an enthusiastic partisan, he later opposed negation of individual human values. This alteration was progressively reflected in his novels, such as "Dialogue with Death" (1938), "Darkness at Noon" (1940), "Arrival and Departure" (1943), and "The Age of Longing" (1951). "Thieves in the Night" (1946) deals with the problems of Palestine and Zionism.

Of his several volumes of essays, "The Yogi and the Commissar" (1945) studied the principles of political volition, and "Insight and Outlook" (1949) explores aesthetics and literary criticism and enunciates Koestler's philosophy of art. The two-volume autobiography ("Arrow in the Blue," 1952, and "The Invisible Writing," 1954) is strongly anti-Communist in tone. "The Sleepwalkers" (1959) is a history of cosmology (the metaphysical study of the nature of the universe), with emphasis on Copernicus, Kepler, and Galileo and their part in changing man's vision of the cosmos.

Koffka (*kŏf'kä*), KURT, psychologist, born in Berlin, Germany, March 18, 1886; died in Northampton, Mass., Nov. 22, 1941. A research professor at Smith Coll. (1927-41), Koffka became noted for his work in the field of visual perception. His important writings include "The Growth of the Human Mind" (1924) and "Principles of Gestalt Psychology" (1935).

Kohinoor (*kō-ĭ-nōōr'*), or KOHINUR, a famous

diamond now owned by the crown of Great Britain. It was secured from India when the Punjab was annexed. Originally the weight was 793 carats, but it was reduced by cutting until now it weighs only 102¾ carats.

Kohlrabi (*kōl'rä-bĭ*), a kind of cabbage grown for food. The stem is greatly enlarged and is fleshy and turnip-shaped. It resembles in taste the rutabaga grown extensively in the Scandinavian countries, especially in Sweden.

Kokomo (*kō'kō-mō*), a city in north central Indiana, seat of Howard County, 50 m. N. of Indianapolis, served by the Pennsylvania and the New York, Chicago & St. Louis R.R.'s. The first successful spark ignition automobile was invented here by Elwood Haynes (1893). The city's manufactures include iron and steel, brass, canned goods, stoves, lumber products, flour, furniture, and machinery. The place was settled in 1844 and incorporated in 1865. Population, 1950, 38,672; in 1960, 47,197.

Kola (*kō'lä*), or COLA, the name of a plant native to tropical regions of Africa, but now cultivated for its fruit in Brazil and the West Indies. The fruit, known as *kola nut,* is about 1 in. long, has a reddish-gray color, and its odor resembles that of nutmeg. It contains about two per cent of alkaloid caffeine. Kola is used in the preparation of some popular drinks.

Kola, one of the northernmost towns of European Russia, in the Karelian Socialist Soviet Republic, on the Kola Peninsula. It lies in lat. 68° 53′ N. and long. 30° 40′ E. First mentioned about 1264, Kola was fortified in the 16th century. North of Kola is the naval station of Aleksandrovsk, founded in 1895. Opposite Kola is the port of Murmansk, ice-free from May to September; both places lie well north of the Arctic Circle. During the Russian revolution an Allied expeditionary force of British, French, and American troops operated nearby in support of the White Russians (1918). Population, *ca.* 650.

Kolchak (*kōl-shäk'*), ALEKSANDR VASILIEVSCH, naval officer and soldier, born in Russia, 1874; died at Irkutsk, Feb. 7, 1920. Kolchak became famous for his defense of Port Arthur during the Russo-Japanese War (1904-05). In the First World War he attained the rank of rear admiral when he was in command of the Black Sea fleet; promoted to vice admiral, he was assigned to command of the Baltic Sea fleet. After the Russian revolution of 1917 he organized a White Russian counter-revolutionary army in Siberia and led it in a number of attacks on the Bolsheviks. Successful at first, the White Russian forces were eventually beaten back, and Kolchak was captured and executed early in 1920.

Kollontai (*kōl'ōn-tī*), ALEKSANDRA MIKHAILOVNA, diplomat and politician, born in Russia in 1872; died in Moscow, March 9, 1952. Active in the Bolshevik underground, she participated in the revolution of 1917 and became the first commissar of social welfare in the new Soviet regime. In 1927 she was appointed Russian ambassador to Mexico, the first woman in the world to hold such a post. Named ambassador to Sweden in 1930, she held a key post during World War II. As Soviet representative to neutral Sweden, she acted as unofficial go-between in the negotiations between the U.S.S.R. and Finland (1939-40). She was also known as a writer; one of her novels was published in English as "Red Love" (1927) and as "Free Love" (1932).

Kol Nidre (*kōl nĭd'rā*), Hebrew meaning all vows, the opening words of the main prayer recited at the evening service of Yom Kippur (*q.v.*). Its accompanying tune, familiar synagogical music, has been developed into variations for violin, cello and orchestra by the composer, Max Bruch (1838-1920).

Konev (*kō'nĕf*), IVAN S., Soviet army officer, born in Ladeino, Russia, in 1897. Active in the Russian revolution, Konev organized the first Congress of Soviets in his native district. In 1923 he became military commissar of the peoples' revolutionary army staff, and after serving in various other military posts was made commander of the second separate Red Banner army (1938). The following year he was also named alternate member of the Central Committee of the Communist party. A lieutenant general at the outbreak of World War II, he was put in command of the central front in Russia. He later commanded the second Ukranian army in its drive which recaptured Orel, Belgorod, Kharkov, and other cities. Appointed marshal in 1944, he became commander on the first Ukrainian front (1945) and directed the final battles of the Ukraine. He then led his troops in recapturing Prague, and his forces were among the first to enter Berlin. After the war, Konev was put in charge of Soviet occupation in Austria.

Kong Mountains (*kŏng moun'tĭnz*), a mountain chain of Western Africa, stretching along the northeastern boundary of Liberia, and attaining to heights of about 1 m. above sea level. In these mountains the Niger has its source, flowing from them toward the northeast. The district is populated by Mohammedans. It contains valuable timber and minerals. The slopes and valleys are highly fertile, producing grasses, cereals, and fruits.

Kongo (*kŏng'gō*). See *Congo.*

König (*kä'nĭk*), FRIEDRICH, printer, born at Eisleben, Germany, Apr. 17, 1774; died at Oberzell, Germany, Jan. 17, 1833. König's signal achievement was the invention of the steam printing press, which he patented in 1810. His original steam-run press resembled the hand press in that its printing process involved the use of

two flat plates; a great improvement was made a year later when he modified the new press by adding a cylindrical plate. He and Andreas Bauer began to manufacture the new printing presses in 1817.

Königgrätz (*kē-nĭg-grĕts'*), in Czech, HRADEC KRÁLOVÉ, a town in Czechoslovakia, capital of the region of Hradec Králové (area, 1,986 sq. m.; population, 1947, 552,780). It is situated on the Elbe River, *ca.* 60 m. E. of Prague. Important as an industrial center, it has varied manufactures of textiles, metalware, soap, furniture, photographic equipment, pianos, leather, and beer. A notable landmark is a cathedral dating from the 14th century. Near the city, on July 3, 1866, the Prussians defeated the Austrians in the decisive battle of Sadowa. Population, 1947, 51,480.

Königsberg (*kē'nĭgs-bĕrg*), in Russian, KALININGRAD, a seaport city and capital of former East Prussia (*q.v.*), incorporated into the western U.S.S.R. after the Potsdam Conference, 1945. It is the capital of the Kaliningrad oblast. Important as an ice-free Baltic port, it is situated on the Pregel River near the Frisches Haff, an inlet of the Baltic Sea, 80 m. E. of Danzig. The industries include manufactures of copper and steel, locomotives, iron products, earthenware, textiles, and cement. Such landmarks as the building of the Univ. of Königsberg (founded 1544), a 14th-century Gothic cathedral, and a 17th-century castle were destroyed in 1945, when the Russians subjected the city to a two-month siege.

Königsberg was founded in 1255 by the Teutonic Knights and joined the Hanseatic League in 1340. Except for brief periods, it was the capital of the Duchy of Prussia, 1525-1701. In 1946 it was renamed Kaliningrad. The city is famous as the birthplace and lifelong residence of the philosopher Immanuel Kant (*q.v.*). Population, 1939, 368,433.

Königshütte (*kē-nĭgs-hü't̬ę*), a city of Poland. See *Królewska Huta.*

Königsmark (*kē'nĭgs-märk*), the name of a family of Swedish nobles. Count Philipp Christoph von Königsmark (1662-1694) served in the army of the elector of Hanover. He is presumed to have been murdered when his liaison with Sophia Dorothea, wife of the crown prince (later George I of England), was discovered. His sister, Countess Maria Aurora (1669-1728), was the mistress of Augustus II of Poland and Saxony and the mother of Maurice, Marshal Saxe (*q.v.*). George Sand (*q.v.*) was a descendant of the latter.

Koninck (*kō'nĭngk*), PHILIPS DE, painter, born in Amsterdam, the Low Countries, Nov. 5, 1619; died there, Oct. 4, 1688. One of Rembrandt's most talented students, he painted many landscapes, similar to the work of his master in their richness and warmth of tonal atmosphere. His work is best represented by "Entrance to a Forest" and "Landscape."

Konoye (*kō-nō-yĕ*), PRINCE FUMIMARO, statesman, born in Tokyo, Japan, 1891; died there, Dec. 15, 1945. Descended from the old Japanese nobility, he entered the House of Peers as the protégé of Prince Saionji, becoming its president in 1933. Shortly after he accepted the premiership in 1937, the war with China was renewed. Konoye formulated an aggressive foreign policy for Japan on the continent of Asia and in the Pacific and built up an intense nationalistic one-party government. In 1939 he resigned to become president of the privy council and minister without portfolio. Re-elected premier the following year, he concluded an alliance with the Axis Powers (*q.v.*), but his inability to reach an agreement with the U.S. in 1941 led to his resignation. After World War II he committed suicide to avoid trial as a war criminal.

Konya (*kō-nyä'*), a city in south central Turkey, the capital of Konya province (area, *ca.* 19,000 sq. m.; population, 1950, 740,595). The city does a thriving trade in fruits; carpet and textile manufacturing are major industries. Founded by the ancient Phrygians, it was originally named Iconium. Later it became the capital of Lycaonia province and was part of the Byzantine empire. Captured by the Seljuks in the 11th century, the town passed under the control of Frederick Barbarossa in 1190. Toward the end of the 14th century it was included in the Turkish empire. Population, 1950, 64,509.

Koo (*kōō*), VI KYUIN WELLINGTON, statesman, born Ku Wei-chun in Shanghai, China, 1888. Educated at Columbia Univ., he has been prominent in the Kuomintang and Nationalist governments of China since 1912. During the 1920's he served variously as minister of foreign affairs and prime minister; he has represented his country in Mexico, Cuba, France, England, the Paris Peace Conference (1919) and the League of Nations. Head of the Chinese delegation to the San Francisco Conference (1945), he has been Nationalist China's ambassador to the U.S. and the U.N. since 1946.

Kookaburra (*kŏŏk'ä-bŭr-ä*). See *Kingfisher.*

Kootenai (*kōō't̬'n̬-ä*), an American Indian tribe, residing near the headwaters of the Columbia River—in British Columbia, Montana, and Idaho. Their culture was originally like that of the Plateau Indians, in that salmon, roots, berries, and deer were the staples of their diet. After the introduction of the horse, however, the Kootenai developed the culture traits of the Plains Indians—chiefly the buffalo hunt. In this way, the buffalo came to dominate their lives, the flesh of the animal serving as their food and the animal's skin providing them with tents and clothing. Kootenais today number *ca.* 350.

Kootenay or KOOTENAI, a 400-m.-long river in Canada and the U.S. which rises in the Rocky Mts. of British Columbia. It flows south through the states of Montana and Idaho, then turns north into Canada again, where it enters 65-m.-long Kootenay Lake, leaving midway to join the Columbia River. Navigation is insignificant, because of the numerous rapids and the tortuousness of its course. The valley of the Kootenay is rich in iron and other minerals.

Korah (*kō'rą*), in the Bible, a Hebrew leader, whose desert rebellion against Moses ended with his destruction by fire and earthquake (Numbers 16; 17).

Koran (*kō'răn*) or AL KORAN, the sacred book of the Mohammedans. According to Islamic belief, it contains the revelations as received by Mohammed (*q.v.*) from God. Based on a number of pre-existing texts, the book was compiled after the death of the prophet by his son-in-law, the Caliph Othman, in the middle of the 7th century.

Courtesy Bettmann Archive, N. Y.

READING THE KORAN
Indian miniature painting, 17th century

The Koran consists of 114 chapters (*suras*). In comparison with the Old and New Testaments, the lack of chronological and logical order is surprising. Entirely heterogeneous elements are coordinated. Rhythmical and aural considerations have obviously been the main principle of organization, since the whole book was written to be read aloud to the believers. The Koran stresses the unity and the dominion of God, and enjoins true believers to worship Him—to "remember God standing and sitting or lying on their sides." In addition to setting down devotional regulatons, the Koran prescribes rules for daily living in the family, the marketplace, and in society at large. Islamic jurisprudence stems directly from the ethical precepts laid down in the Koran. Reading the Koran, studying it, and explaining it are the main occupations of the pious Mohammedan and are considered as important as prayer and the giving of alms. The figures of Moses and Christ and many stories and parables from the Old and New Testaments are amalgamated into the Koran, although worship of Christ as the Son of God is definitely condemned.

The Koran is written in classical Arabic, and, besides its religious importance, has been of greatest influence on all subsequent Arabian literature. See also *Arabia:* LITERATURE.

Korea (*kō-rē'ą*), formerly CHOSEN, a political area in eastern Asia located between the parallels of 34° 17′ and 43° N. and between the meridians of 124° 38′ and 130° 33′ E. It is bounded by Manchuria on the N., by the Japan Sea on the E., by the Korea Strait on the S., and the Yellow Sea on the W. At its northeastern tip it has a mutual border of about 11 m. with the Soviet Union. The Yalu River is its main boundary with Manchuria, and it lies across the Korea Strait from Japan. A peninsula about the size of Florida, it is approximately 600 m. long and 135 m. wide, with an area of 85,266 sq. m.

DESCRIPTION. The surface is generally mountainous, with numerous fertile valleys and a pro-

Courtesy Ewing Galloway, N. Y.

VILLAGE STREET IN KOREA
About half of the country's population lives in thatched huts like those shown in the picture

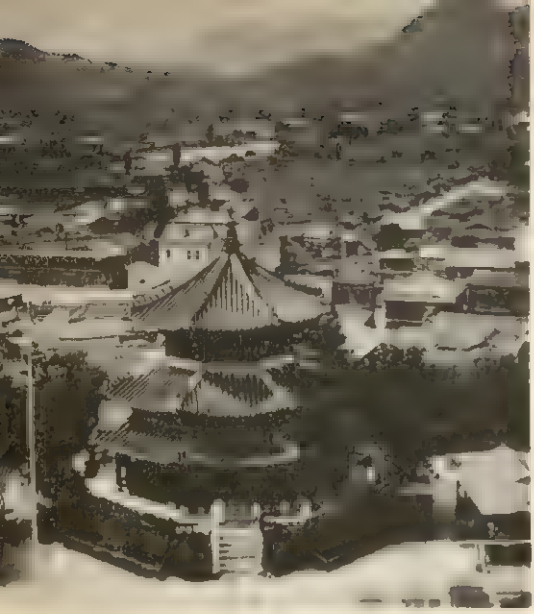


Photo by B. Holmes, courtesy Ewing Galloway, N. Y.
VIEW OF SEOUL, THE CAPITAL OF KOREA

ductive sea coast. The main rivers, including the Yalu, the Ta-tung, the Han (or Kan), and the Keum flow westward, draining into the Yellow Sea. The Tumen, with headwaters in Manchuria, is the only stream of note which flows to the Sea of Japan. The highest mountains, with elevations from 3,500 to 8,000 ft., are in the northern part. A spine of hills called Kum-gang-san by the Koreans extends down the eastern coast; in the western part of the country the land rises more gradually from the shore.

The northern and eastern mountainous areas are richly forested with fir, lime, pine, oak, birch, ash, bamboo, mulberry, and hornbeam. The abundant wildlife includes deer, otter, fox, badger, and squirrel. Birds, particularly numerous along the coast, include the crane, ibis, heron, egret, hawk, kingfisher, duck, goose, oriole, cuckoo, and hawk.

The temperate climate is midway between that of maritime Japan and continental China. In summer the average temperature is 75° F.; the yearly range is from 5° in winter to 90° in summer. Annual rainfall is about 36 in., most of it falling between May and September.

Mining. Korea has a considerable variety of mineral deposits, most of them in the northern half of the country. It is one of the leading gold producers of the Far East. Coal and iron are relatively plentiful, with the centers of production in the north. Copper, graphite, zinc, lead, magnesite, wolfram (tungsten), and silver ores are also found.

Agriculture. Korea is mainly an agricultural country, and rice is its principal crop. About 27 per cent of its cultivated area of 11,000,000 acres is normally devoted to rice. Barley, wheat, other grains, beans, tobacco, and cotton are also important products. During the Japanese occupation farm tenancy was prevalent, and rents averaged more than 50 per cent of annual crops. In southern Korea in 1948 1,400,000 farm plots formerly owned by Japanese were sold to Koreans, and in 1949 another land reform measure gave about 1,000,000 additional tenants the opportunity of buying their own farms. In Russian-occupied north Korea in 1946 tenant-tilled farms, amounting to 50 per cent of the zone's farmland, were confiscated from landlords and distributed among agricultural workers, tenants, and small farmers.

Manufacturing. Korea's most important industry is the production of nitrogenous fertilizer, particularly at Konan on the east coast of the ndrth. Output of hydroelectric power, also centered in the north, plays a significant part in the economy; the cotton, silk, and rayon industries, the production of cement, light consumer goods, and processed foods are other notable activities.

Fisheries. Both inshore and offshore fishing provide salmon, halibut, herring, shark, and sardines for domestic consumption and export. Whaling is carried on near the coast, and whale meat is regarded as a delicacy.

Trade and Transportation. Before World War II Korea's trade was largely with Japan. In postwar years north Korea has traded mainly with the Soviet Union, while the U.S. has become the most important supplier of south Korea. Exports include tungsten ores and concentrates, graphites, marine products, and ginseng. Imports are chiefly foodstuffs, fertilizers, petroleum, machinery, paper products, and medicines. There are about 3,000 m. of railroads and 18,000 m. of roads, including unsurfaced tracks. River transport also provides internal communication. Pusan and Inchon are leading seaports and centers for both coastal and overseas shipping.

Religion and Education. Buddhism and Confucianism have been Korea's basic forms of religion. Ancestor worship, once prevalent, is declining. Protestant and Roman Catholic missionaries have spread Christianity to a sizeable portion of the population. The Japanese educational system left the mass of Koreans with little or no formal schooling. American occupation authorities in south Korea stimulated a campaign against illiteracy. In 1948 there were 3,415 elementary schools with 2,708,000 pupils and some 400 middle, technical, and normal schools with more than 400,000 students. A number of colleges were organized as a national university at Seoul.

Population. The Korean people, similar to both the Chinese and Japanese, are believed to include among their ancestors invaders from the Manchurian plains, Mongolia, and Central Asia. Their language belongs to the Ural-Altaic group. The population, according to Japanese censuses, was 19,522,000 in 1925 and 25,900,000 in 1944.

Estimated population in 1950 was 29,291,000, of which about 20,000,000 were in South Korea. Seoul (*q.v.*) is the capital of South Korea.

GOVERNMENT. A subject kingdom of China for centuries and a Japanese colony in recent years, Korea saw its political destiny shaped by the outcome of World War II. Despite the assumption of the victorious powers that Korea was to achieve its independence as a unified country, the military occupation north of the 38th parallel by the Russians and south of that line by American troops led to the establishment of two separate regimes claiming jurisdiction for the whole nation. The Russians, who arrived in August 1945, established a Communist-led provisional government which evolved into a "Korean People's Republic" with its capital at Pyongyang in September 1948. In the zone occupied in September 1945 by the U.S. Army, elections were held under the observation of a U.N. commission in May 1948. Two hundred delegates to the national assembly were chosen, and 100 seats were left vacant for the eventual selection of representatives from North Korea, where Soviet authorities had not permitted polling. The assembly, sitting at Seoul, the southern capital, approved a constitution for the Republic of Korea on July 12, 1948. It specifies that the national assembly, members of which are chosen for four-year terms, elects the president and vice president. The president in turn appoints a prime minister with approval of the assembly. In practice the president has considerable power, dominating his cabinet and even the unicameral legislature.

HISTORY. The origins of Korea, about 4,000 years ago, are obscure. One tradition dates the founding of Korean society at 2333 B.C., while another places it at 1122 B.C. Archaeologists believe that various clans and tribes reached the state of a bronze and iron culture before the Christian era. Recorded history begins with the period of the Three Kingdoms between 57 B.C. and A.D. 668. After rivalry among the three, the southeastern kingdom, allied with the T'ang Dynasty of China, established rule over the entire peninsula in 668, maintaining dominance for 300 years during a golden age when the arts thrived and great temples and pagodas were built. In the subsequent Koryo period (935-1392) Korea fell under Mongol domination.

General Yi T'aejo established a dynasty in 1392, with Seoul as its capital, which did not end until the Japanese annexation in 1910, although both Japan and China invaded the country during the 16th and 17th centuries. Known as the "hermit kingdom," Korea under the Yi Dynasty clung to isolation, but it maintained a tributary status in the Chinese Confucian system and had relatively unhampered contact with China. Trade with Japan through the port of Pusan was another long-established link with the outside world, but it was not until the end of the 19th century that Western influence and international diplomacy had its full impact on Korea.

International News Photos

AMERICAN TROOPS LAND IN KOREA

Revolts against the Korean court in 1882 and 1884 led to Chinese backing for the ruling government. Unrest in 1894, however, brought both Chinese and Japanese troops into the country and ended with Korea's becoming a Japanese protectorate in 1895. After eliminating Russia as a Far Eastern rival in 1905 and gaining the acquiescence of other powers, Japan annexed Korea in 1910. Resistance to Japanese rule among Koreans persisted, however, and the U.S., Great Britain, and China pledged that "in due course Korea shall become free and independent." The Soviet Union later adhered to this promise, but Korea was divided for the purposes of military occupation after the war, and two separate states emerged. With Soviet troops stationed above the 38th parallel, North Korea fell under the rule of a Communist regime. Southern Korea, under U.S. occupation, established itself as the Republic of Korea with an elected assembly and with Dr. Syngman Rhee as president. Both governments claimed the right to rule all of Korea, and the United Nations (*q.v.*), which sought the country's unification, was unable to bring about a settlement in the face of Communist noncooperation. Russian troops were withdrawn from North Korea at the end of 1948, and in June 1949 the last U.S. troops left the country.

An uneasy truce prevailed between the Communist and non-Communist halves of the nation until June 25, 1950, when the North Korean regime launched a full-scale invasion southward across the 38th parallel. The U.N. Security Council (with Russia absent) called upon member states to assist the Republic of Korea, and U.S. forces immediately went into action, to be joined

later by troops from 15 other U.N. nations. Commanded by Gen. Douglas MacArthur (*q.v.*), the U.N. contingents were first pressed back on the southern port of Pusan but then sent the North Koreans into retreat after they had outflanked the Communist lines in a bold amphibious landing at Inchon on Sept. 15. The U.N. troops pursued the North Koreans across the 38th parallel and reached the Yalu River on the country's northern border in November 1950. At this point Chinese Communist forces—allegedly all volunteers—poured into Korea, snatching victory from the U.N. army and forcing its retreat to the vicinity of the 38th parallel, where the battle line reached a stalemate for the next two years.

The conduct of the Korean war and the issue of aggression by Communist China caused acute controversy both among U.N. members and on the U.S. domestic political front. President Truman relieved Gen. MacArthur of his command in April 1951 after ill-concealed policy differences, including the general's desire for more vigorous action against China. Diplomatic exchanges at the U.N. in June 1951 led to armistice negotiations in the field, which were frequently interrupted, during the two years the talks continued. The last impasse over the repatriation of prisoners of war was finally broken when the Communists agreed that North Korean and Chinese captives in U.N. hands could be turned over to a neutral nations commission if they refused to return to their homelands. The truce arrangements were vigorously criticized by the South Korean government, with Pres. Rhee demanding unification of the country. South Korean consent to the armistice terms was won only after the conclusion of a mutual defense pact with the U.S. and promises of American economic aid. The truce went into effect on July 27, 1953 (July 26, U.S. time), bringing the fighting to a halt but doing little to resolve international strife over the future of Korea. The armistice terms called for a political conference within 90 days, but this meeting did not take place until April 1954, when it considered other Far Eastern questions and adjourned in July without agreement on Korea. See also *United States*.

Körner (*ḳēr'nēr*), KARL THEODOR, poet, born in Dresden, Germany, Sept. 23, 1791; died Aug. 26, 1813. He first studied at the Acad. of Freiberg and later at Leipzig and Berlin. In 1813 he was appointed dramatist at a Vienna theater, but resigned to join the military movement to free Germany from the French under Napoleon. He was killed in the engagement at Rosenberg. His patriotic songs, accompanied by the music of von Weber, became German nationalist songs. He is the author of "Zriny," a historical drama, and "Rosamunde," a dramatization of the story of Henry II of England and his mistress, Rosamond.

Korngold (*ḳôrn'gōld*), ERICH WOLFGANG, composer, conductor, and pianist, born in Brünn, Austria, May 29, 1897; died in Hollywood, Calif., Nov. 29, 1957. He began his musical career as a child prodigy with a successful concert in Vienna in 1911. He composed in a variety of forms: chamber music, choral music, orchestral pieces, sonatas, and operas; among those most frequently performed is the opera "The Dead City" (1920). His work is notable for his skillful handling of themes and original use of orchestral instruments. He came to the U.S. in 1934 and is considered a pioneer in music for motion pictures.

Korolenko (*ḳô-rô-lĕn'ḳō*), VLADIMIR GALAKTIONOVITCH, author, born in Zhitomir, Russia, July 27, 1853; died at Poltava, Dec. 25, 1921. Because of political activities, he was exiled to Kronstadt (1874) and finally sent for six years to Siberia. He was allowed to return to Russia in 1885, when he settled at Nizhni Novgorod, and devoted his time to literature. He is one of the popular Russian writers of recent times. His best-known writings are "The Blind Musician" and "Prokhor and the Students."

Kosciusko (*ḳŏs-ĭ-ŭs'ḳō*), MOUNT, the highest mountain peak of Australia, located in the Australian Alps in New South Wales. It has an altitude of 7,316 ft.

Kosciuszko, THADDEUS, Polish general and patriot, born near Minsk, Russia, Feb. 12, 1746; died in Switzerland, Oct. 15, 1817. Descended from a Lithuanian family, he was educated at the military school at Warsaw, and came (1776) to America to aid the colonists in the Revolutionary War, rising in rank to brigadier general. His services were especially valuable at Bemis Heights, near Saratoga, and in planning the fortifications at West Point.

He returned to Europe in 1786. In 1794 he was appointed general of the insurgent army of Poland in the war against Russia, having previously served with distinction at Dubienka. He led his forces against the Russian troops at Raclawice, near Cracow, and there obtained a brilliant victory. Subsequently the Poles in Warsaw joined the insurrection, after which he organized a provisional government and effectually resisted the united Prussian and Russian armies for several months. Though inferior to the allied armies, his forces held Warsaw, and even compelled the enemy to raise the siege of that city. At last he was overpowered in the Battle of Máciejowice, on Oct. 10, 1794, and, after being wounded, was taken prisoner. The Russians confined him at St. Petersburg until after the death of the Empress Catherine, but he was restored to liberty on the accession of Paul I, in 1796.

He later visited the U.S., where Congress granted him a pension and gave him a tract of land. The closing years of his life were spent

in France and Switzerland, his death occurring in the latter country at Solothurn from an accident while riding a horse.

Kosher (*kō'shĕr*). See *Kasher.*

Kossel (*kŏs'ĕl*), ALBRECHT, physiologist, born in Rostock, Germany, Sept. 16, 1853; died July 5, 1927. After graduating in medicine in 1878, he became an assistant in the Inst. of Physiological Chemistry at the Univ. of Strasbourg, and five years later was made head of the chemistry section of the Berlin Physiological Inst. He then taught at the Univ. of Berlin, and at Marburg, and in 1901 accepted a position at the Univ. of Heidelberg, remaining there until his retirement in 1923. Kossel's research centered in physiological chemistry and he is famous for his discoveries concerning the chemical structure of cells and proteins. He wrote numerous articles on his research, most of which were published in the scientific journal, *Zeitschrift für physiologische Chemie,* of which he was editor. In recognition of Kossel's discoveries, the Nobel Prize for Physiology and Medicine was awarded him in 1910.

Kossuth (*kŏsh'ōōt*), LOUIS, Hungarian patriot, born at Monok, Hungary, Apr. 27, 1802; died in Turin, Italy, Mar. 20, 1894. He descended from a family of noble rank, studied law at the Protestant college of Sárospatak, and established a successful practice at Pesth. In 1832 he became a member of the diet at Presburg. Soon after he began the publication of a liberal newspaper at Pesth, but it was suppressed by the government. He was arrested for treason in 1837, and was afterward condemned to four years' imprisonment. The liberals in the diet insisted upon his release and refused to vote supplies to the government, causing him to be liberated after 18 months' confinement. He founded the *Pesti Hirlap* in 1841. This publication met with much political and financial success because of its advanced views on government. In 1847 he was elected a deputy to the diet, where he soon became a prominent leader of the reform forces. Among the demands made by him were that feudal privileges be abolished and the press made free, and, after the French Revolution of 1848, an independent government for Hungary was demanded.

LOUIS KOSSUTH

The national assembly of 1849 was induced by the influence of Kossuth to declare that all rights to the throne had been forfeited by the Hapsburg Dynasty, and he was given an appointment as provisional governor of Hungary. However, this movement failed for want of European support and because of a defeat at Temesvár, Aug. 9, 1849, when he resigned as dictator in favor of Görgey and soon after fled to Turkey. There he was made a prisoner, but was liberated in 1851 and soon after visited the U.S. While in America he spoke before large and enthusiastic audiences in favor of Hungarian independence, and was shown distinct marks of approval in behalf of his cause. He returned to Europe in 1852, making his residence in England until the Italian War of 1859 against Austria began, when his hopes of Hungarian independence were revived anew. However, he was disappointed in the speedy peace concluded at Villafranca. After the war he resided principally at Turin, where he devoted his attention to scientific research, and refused to return to his native land after the amnesty of 1867 was announced, declaring his continuous opposition to the requirement of declaring allegiance.

Kostelanetz (*kŏs'tĕ-lä'nĕts*), ANDRE, orchestra conductor, born in Leningrad, Russia, Dec. 22, 1901. He came to the U.S. in 1922 and went to work with the Andreas Dipple Opera Company. After two years he became an accompanist for singers of the Metropolitan and Chicago Opera Companies. In 1928 he started with the American Broadcasting Co. as pianist and conductor, and in 1931 was signed for his first commercial show. Since that time he has led his 45-piece orchestra in some of the most important commercial shows of radio. He married opera singer Lily Pons in 1938, and they have since given a number of performances together. These joint concerts have drawn some of the largest audiences in the history of the music business. Kostelanetz also appears each season as guest conductor of the country's major symphonies and has done some musical direction for the screen. Known for their popular appeal, his programs are distinguished by their blend of classical and jazz music.

Kotzebue (*kō'tsę-vu*), AUGUST FRIEDRICH FERDINAND VON, dramatist, born at Weimar, Germany, May 3, 1761; died Mar. 23, 1819. He

studied law at Jena and Duisburg, but soon organized an amateur theater at Duisburg. Later he established a law office at Weimar, where he succeeded in building up a lucrative practice, but in a short time entered the civil service of Russia. From 1795 until 1798 he lived at his county seat near Reval, where he devoted much of his time to literary work. He is the author of many dramatic pieces and a few historical works. He had a brilliant dramatic sense, and his plays had considerable influence on dramatists who followed him. Among his books are "The Cricket," "The Stranger," "The Bee," "The Most Remarkable Year of My Life," and the "Favorite Coachman of Peter the Great."

Koumiss (*kōō'mĭs*), or KUMYS, a fermented beverage made originally by the Tartars from the milk of mares. It is now made from the milk of cows. Large quantities are manufactured in Europe and the U.S. It is valuable for its nutritive and digestive properties, and is prescribed by physicians in cases where other food cannot be retained by the stomach. Mares' milk, which contains a high percentage of sugar, was used largely for this purpose in Russia and Siberia, but the product made from it and from the milk of goats is characterized by a somewhat unpleasant odor. About 40 hours are required for fermentation. The product contains a considerable percentage of alcohol and carbonic acid.

Koussevitzky (*kōōsh-ĕ-vĭt'skȳ*), SERGE ALEXANDROVITCH, conductor and composer, born in Vishny Volotchsk, Russia, July 26, 1874; died in Boston, Mass., June 4, 1951. He studied music at the Moscow Conservatory, where he was later a professor and a double bass virtuoso. In 1910, he founded and for eight years served as director of the Koussevitzky Symphony Orchestra, with which he toured Russia, giving concerts to thousands who had never before heard great music. In 1920, he went to Paris and established a similar orchestra, which toured Europe, featuring especially the work of modern composers. In 1924 he became conductor of the Boston Symphony Orchestra, serving until 1949 when he retired. He initiated the Berkshire Music Center in Tanglewood at Lenox, Mass., in 1938 and was its director from 1940 until his death.

SERGE A. KOUSSEVITZKY

Kovno (*kŏv'nō*), or KAUNAS, a city in Lithuania, capital of the government of Kovno, situated near the junction of the Vilia and Niemen Rivers. It is important as a railroad and commercial city. It is surrounded by an agricultural country and has a large trade in produce. The manufactures include beet sugar, clothing, earthenware, and machinery. It is the seat of the Univ. of Vytautas the Great. Kovno was founded in the 10th century. Although strongly fortified it was captured by the Germans in 1915 and 1941. Population, *ca.* 100,000.

Krafft-Ebing (*krăft-ĕ'bĭng*), BARON RICHARD VON, neurologist, born at Mannheim, Germany, Aug. 14, 1840; died at Mariengrün, near Graz, Austria, Dec. 22, 1902. A pioneer in the scientific study of the human mind, Krafft-Ebing was professor of psychiatry at the Univs. of Strasbourg (1872-73), Graz (1873-89), and Vienna (1889-1902). His work in forensic psychiatry was of prime importance in the development of neurology, and his noted *"Psychopathia Sexualis"* (1886) has long been a standard work in psychiatry libraries.

Kraft (*krăft*), ADAM, sculptor, born at Nuremberg, Germany, in 1455; died in 1509. Trained in his native town, he became known as a sculptor through a series of seven reliefs (1490), known as "The Seven Stations," now in the German Museum, Nuremberg. About 10 years later he completed his master work, a towering structure of 62 ft. known as the "Tabernacle," in the Church of St. Lawrence. Among his other works are "Tomb of the Schreyer Family," "Scenes in the Passion of Christ," and "Tomb of the Rebeck Family."

Together with Veit Stoss and Peter Visscher, he best represents German sculpture at the turn from the Gothic to the Renaissance style. Kraft himself, however, was strongly bound to Gothic forms.

Krakatao (*krä-kȧ-tä'ō*), an island in the Strait of Sunda between Java and Sumatra. It is of volcanic origin. The area is 6 sq. m. This island is celebrated on account of numerous earthquakes and volcanic eruptions that are associated with it. It was the scene of vast disturbances in 1883, when explosions were perceptible at a distance of 150 m. Though the island is uninhabited, about 35,000 people were killed on the islands in the vicinity by great tidal waves that swept away

several villages and a number of towns. The detonations were heard as far away as 2,500 m. Prior to the disturbances the island was more than twice its present size. In 1928 and 1929, the volcanic cone, now under water, appeared above the surface of the water, throwing up lava, ashes, and steam. Small islands that were formed by this upheaval were inundated by the sea in 1930.

Kraków (*krä'kōōf*). See *Cracow*.

Krasnodar (*kräs'nō-där*), a territory of the Russian S.F.S.R., in the U.S.S.R., north of the Caucasus Mts. and bordering on the Sea of Azov and the Black Sea. It is traversed by the Kuban River. The territory, with an area of *ca.* 32,800 sq. m., has rich oil and mineral resources and important forests but is essentially an agricultural region, producing wheat, cotton, sugar beets, and rice. The principal towns are Krasnodar, Novorossisk, Armavir, and Tuapse.

The capital city, Krasnodar, is on the Kuban River, about 160 m. s. of Rostov. It has manufactures of foodstuff, petroleum products, agricultural machinery, and leather. The city was founded in 1794 as a Cossack fort under Catherine the Great and was named Ekaterinodar in her honor. It was renamed Krasnodar in 1920. In World War II the city was occupied by the Germans from August 1942 until February 1943. Population of the territory, 1961 (est.), 3,898,000; of the city, 1959, 313,000.

Krasnov (*kräs'nōf*), PYOTR NIKOLAYEVICH, soldier and author, born in 1869; died *ca.* 1947. During the Russian Civil War he fought on the side of the Whites as head of the Don Cossacks. In 1920 he emigrated and subsequently wrote a number of popular novels based on his wartime experiences, including "From Double Eagle to Red Flag" (1926), "The White Coat" (1929), and "Yermak the Conqueror" (1930). In World War II, while organizing anti-Soviet Russians to fight under the Nazis, he was captured by the Red Army and executed.

Krasnoyarsk (*kräs'nō-yärsk*), a territory of the Russian S.F.S.R., in the U.S.S.R., in central Siberia, extending north to the Arctic Sea. In the southern part there are wheat-growing districts and deposits of brown coal, manganese, and mica; the central and north central parts are covered by a huge taiga forest and are inhabited only along the navigable rivers, while the northern part is an arctic tundra area. The Yenisei River traverses the territory from south to north, and the Trans-Siberian Railway crosses it from west to east. Area, about 928,000 sq. m.

The capital city, Krasnoyarsk, is situated where the Trans-Siberian Railway crosses the Yenisei River and is an important produce shipping point. It manufactures locomotives, farm machinery, paper, tools, and flour. Population, territory, 1961 (est.), 2,698,000; city, 1959, 412,000.

Kraus (*krous*), KARL, journalist and poet, born in Jicín, Bohemia (now Czechoslovakia), April 28, 1874; died in Vienna, Austria, June 12, 1936. From 1899 until his death he edited, and for the most part wrote, *"Die Fackel"* (The Torch), a satirical Austrian periodical. His long drama, *"Die letzten Tage der Menschheit"* (The Last Days of Humanity), appeared in 1918 and deals with World War I. Some of his poetry has appeared in English translation, under the title "Poems" (1930).

Krefeld (*krā'fĕlt*) or CREFELD, a city of Germany, in the *Land* (state) of North Rhine-Westphalia, formerly in the Rhine Province, Prussia, 12 m. N.W. of Düsseldorf. Krefeld, a port on the west bank of the Rhine, is the center of the German silk and velvet industry. Other manufactures include alloy steel, machinery, dyes, plastics, sugar, and soap. The city has an art museum, a music conservatory, and several vocational schools. It was chartered in 1373; it passed to Orange-Nassau in 1600 and to Prussia in 1702. In World War II Krefeld was two-thirds destroyed and was captured by American troops in March 1945. Population, 1950, 171,875; in 1960 (est.), 211,479.

Krehbiel (*krā'bēl*), HENRY EDWARD, critic and author, born in Ann Arbor, Mich., March 10, 1854; died in New York, N.Y., March 20, 1923. He studied law, worked as a reporter and critic on the Cincinnati *Gazette*, and from 1880 to his death was music critic of the New York *Tribune*. He wrote "Studies in the Wagnerian Drama" (1891), "How to Listen to Music" (1896), "The Pianoforte and Its Music" (1910), and "Afro-American Folk Songs" (1914).

Kreisler (*krīs'lĕr*), FRITZ, violinist and composer, born in Vienna, Austria, Feb. 2, 1875; died in New York, N.Y., Jan. 29, 1962. He entered the Vienna Conservatory at the age of seven, winning its first prize three years later and that of the Paris Conservatory in 1887. In 1889 he made a

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successful tour of the U.S. but then abandoned music for some years, studying medicine in Vienna and serving in the Austrian army. In 1899 he resumed his musical career with an appearance in Berlin; this was followed by another American tour (1900-01). In World War I he was wounded while serving with the Austrian army. After 1918 Kreisler toured widely, giving concerts all over the world. He became a U.S. citizen in 1943. By the time of his retirement in 1950 his aristocratic style and great sweetness of tone had made him one of the most celebrated violinists of his time. His compositions—more than 200 works—include concertos, chamber music, light solo pieces for the violin and the piano, and music for three operettas, "Apple Blossoms" (1919), "Sissy" (1933), and "Rhapsody" (1944).

Kremenchug (*krĕm'ĕn-chōōg*), a city of the U.S.S.R., in the Ukrainian S.S.R., 140 m. s.w. of Kharkov on the Dnieper River. A long tubular bridge connects Kremenchug with the south bank of the Dnieper. The city is an important industrial center in the black-earth region, with extensive rail connections and a large trade in grain, lumber, foodstuffs, and tobacco. Founded in 1571, the city was capital of the "New Russia" (1765-89) and suffered damage in the Revolution and civil war (1917-21). In World War II it was held by the Germans from September 1941 until November 1943. Population, 1961 (est.), 95,000.

Kremer (*krā'mĕr*), GERHARD, the German name of Gerhardus Mercator (*q.v.*).

Kremlin (*krĕm'lĭn*), the citadel of Moscow, U.S.S.R., on the north bank of the Moscow River. Triangular in shape, it is enclosed by 15th-century crenelated walls 1½ m. long. The walls are topped on each side by seven towers; above the main gate, opening on Red Square, rises the Spasskiya Gate, or Gate of the Redeemer, which is the main entrance to the Kremlin. The mausoleum containing the body of Lenin is built just outside the Kremlin wall, in Red Square. Within the wall are many buildings dating from pre-Revolutionary times and used by the Red regime for purposes other than those for which they were originally designed. The *Bolshoi Dvorets* (Great Palace), built in the 19th century, houses the Supreme Soviets of the U.S.S.R. and of the Russian S.F.S.R. East of it is Cathedral Square, on which stand the cathedrals of the Annunciation, the Assumption, and the Archangel Michael. Other points of interest are the bell tower of Ivan the Great, nearly 300 ft. high; the arsenal, containing rich collections of jewelry, crowns, thrones, costumes, and armor; the Terem, where the 17th-century Russian rulers resided; the Miracle monastery, and the Ascension convent. In common usage, the Kremlin connotes the administrative and political hub of the Soviet Union. The buildings were closed to the public for 37 years, but in 1955 the Kremlin was finally reopened to sightseers.

Courtesy Sovfoto, N. Y.

THE KREMLIN

Kremsier (*krĕm'zĕr*), in Czech, KROMĚŘÍŽ, a town in central Czechoslovakia, in the *kraj* (region) of Gottwaldov, on the Morava River, 22 m. s. of Olmütz. Manufactures include beer, malt, sugar, flour, and wood products, and the city is a trading center for farm produce. The constituent assembly or Reichstag of Austria met here in 1848 to draft a constitution, which was rejected by the emperor, and the assembly was dissolved. Population, 1947, 17,626.

Krenek (*krē'nĕk*), ERNST, composer, born in Vienna, Austria, Aug. 23, 1900. An exponent of the modern "12-tone" technique of Arnold Schönberg (*q.v.*), Krenek is best known for his jazz opera, *"Jonny Spielt Auf"* (1927). Other compositions include the operas "Orpheus and Eurydice" (1923), "Karl V" (1933), four symphonies, and many orchestral works and songs. Krenek was professor of music at Vassar Coll. (1938-42) and head of the music department at Hamline Univ. (1942-48); he became a U.S. citizen in 1945. He wrote "Studies in Counterpoint."

Kreuger (*krū'gĕr*), IVAR, industrialist, born in Kalmar, Sweden, March 2, 1880; committed suicide in Paris, France, March 12, 1932. After early activity as a real estate broker and building contractor in the U.S. and South Africa, he returned to Sweden (1907) and founded, with Paul Toll, the holding company of Kreuger & Toll. This partnership soon controlled a great combination of firms, mostly matchmaking concerns, securing after World War I three-quarters of

the world match market and an official monopoly in many countries. From 1927 to 1931 the firm lent about $290,000,000 to various governments in return for monopolistic concessions. When the trust was wrecked by speculation and fraudulent financial practices during the depression, Kreuger committed suicide. Later investigations revealed that he had acquired more than $500,000,000 by fraud.

Kreutzer (*kroi'tsĕr*), RODOLPHE, violinist and composer, born in Versailles, France, Nov. 16, 1766; died in Geneva, Switzerland, Jan. 6, 1831. A violin virtuoso from childhood, he taught (1795-1825) at the Paris Conservatory. Kreutzer composed 40 études for the violin, violin concertos, sonatas, and other chamber music, and more than 40 operas and ballets. He was a friend of Beethoven, who dedicated to him the famous "Kreutzer Sonata" (Opus 47).

Kreymborg (*krām'borg*), ALFRED, poet and dramatist, born in New York City, Dec. 10, 1883. His books of poetry include "Mushrooms" (1916), "Less Lonely" (1923), and "Funnybone Alley" (1927); among his published plays are "Lima Beans" (1925) and "Manhattan Men" (1929). He also wrote "Our Singing Strength" (1929), a history of American poetry, and helped to edit "American Caravan" (1927-36), a series of anthologies. In 1953, following a directive of the Eisenhower administration, Kreymborg's books were banned from U.S. libraries in foreign countries.

Kriemhild (*krēm'hĭlt*), the heroine of the *"Nibelungenlied"* (*q.v.*).

Krishna (*krĭsh'nə*), the Hindu god of voluptuous pleasure, evolved from the earlier god of redemption. He is the eighth incarnation of Vishnu (*q.v.*) and is always represented with a transverse flute. His exploits are related in the Mahabharata and the Bhagavad-Gita (*qq.v.*).

Krivoi Rog (*krĭv'oi rōg'*), a city of the U.S.S.R., in the Ukrainian S.S.R., on the Ingulets River, *ca.* 170 m. N.E. of Odessa. It is an important industrial and communications center, located in the midst of rich iron mines and on the edge of the coal-producing Donets Basin. The city suffered heavy damage in World War II and was occupied by the Germans from August 1941 until February 1944. Population, 1939, 197,621.

Krk (*kûrk*), in Italian, VEGLIA, an island (area, 165 sq. m.) of Yugoslavia, in an arm of the Adriatic Sea, off the coast of Dalmatia. The chief town, Krk (population, *ca.* 2,500), on the southern coast of the island, has a 13th-century cathedral and a walled castle. Population, *ca.* 20,000.

Krogh (*krôg*), AUGUST, scientist, born at Grenaa, Jutland, Denmark, Nov. 15, 1874; died in Copenhagen, Sept. 13, 1949. Krogh studied zoology at the Univ. of Copenhagen, receiving a doctor's degree in 1903. He went to Greenland in 1902 to study the tension of carbon dioxide in ocean water and in 1908 to investigate the respiratory metabolism of the Eskimos. Returning in 1908 to the Univ. of Copenhagen to teach, he was made professor of zoophysiology there in 1916. Krogh's research centered on respiration, and his discoveries in that field led to his work on capillaries. In 1920 he was awarded the Nobel Prize for physiology and medicine for his work in discovering the regulation of the motor metabolism of the capillaries.

Kroll (*krōl*), LEON, painter, born in New York City, Dec. 6, 1884. After initial training at the Art Students League and the National Acad. of Design, Kroll studied at the French Julian Acad. in Paris. He returned to the U.S. in 1910 and the following year became an instructor at the National Acad., holding his first one-man show there (1911). Success followed rapidly, and in 1913 he sold 18 paintings in one week for $10,000. Kroll's work, definitely influenced by post-impressionism, shows a great insistence on structure and an expressive color scheme, all based on thorough draftsmanship. Primarily a landscape and portrait artist, he has also painted murals, including the decoration of the Worcester (Mass.) War Memorial.

Kronstadt (*krōn'shtät*), a fortified seaport of the U.S.S.R., on the island of Kotlin, 20 m. w. of Leningrad, with which it is connected by canal. The city is built on the site of a fort built by Peter the Great when he captured the island in 1703. The harbor is safe and large, although icebound about five months yearly. The principal manufactures are ships, clothing, machinery, and arms. Population, *ca.* 25,000.

Kropotkin (*krə-pôt'kĕn*) or KRAPOTKIN, PETER ALEXEYEVITCH, PRINCE, geographer and anarchist, born in Moscow, Russia, Dec. 9, 1842; died near Moscow, Feb. 8, 1921. He studied for the Corps of Pages and in 1862 entered a Siberian Cossack regiment. Later he studied geography and went to Siberia and China to conduct scientific expeditions (1864-67). In 1871 he became interested in the Commune of Paris and joined the revolutionists in Russia. He was arrested in 1874 but escaped two years later and went to England, Switzerland, and France. In Paris he helped establish the French Socialist movement and was again arrested for his political activities. Released in 1886, he settled in London, but returned to Moscow in 1917. His chief publications include "Memoirs of a Revolutionist" (1885) and "The Conquest of Bread" (1888).

Krueger (*krōō'gĕr*), WALTER, army officer, born in Flatow, Germany, Jan. 26, 1881. After coming to the U.S., he studied at the Cincinnati Technical School for two years (1896-98) before enlisting in the army to fight in the Spanish-Amer-

ican War. He remained in the army and by 1939 was a major general in command of the Second Division at Ft. Sam Houston, Tex. In 1941 he was promoted to lieutenant general and sent to the Pacific as commander of the Third Army. He was put in charge of the Sixth Army in 1943, and as commanding general he led the ground forces in the landing on Luzon two years later. In 1946 he retired with the rank of full general. Krueger translated and published several books on army tactics.

Krug (*krōōg*), JULIUS ALBERT, engineer and administrator, born in Madison, Wis., Nov. 23, 1907. Krug studied engineering at the Univ. of Wisconsin and, after graduating in 1930, worked for the Wisconsin Telephone Co. and the Wisconsin Public Service Commission. He was appointed to the Federal Trade Commission (1936), the Tennessee Valley Authority (1938), the Office of Production Management (1941), and the Office of War Utilities (1943). In 1942 he was appointed to the War Production Board; he was made vice chairman in 1943 and chairman in 1944. He served (1946-49) as Secretary of the Interior under President Truman, after which he returned to private industry.

Kruger (*krü'gẽr*), STEPHANUS JOHANNES PAULUS, Boer statesman, born in Colesberg, Cape Colony, Oct. 10, 1825; died in Clarens, Switzerland, July 14, 1904. He accompanied the Boers into Natal and later into the Orange country, devoting his early life to the development of the Transvaal. In 1872 he was elected a member of the executive committee of the South African Republic and later became a general in the army. On Feb. 27, 1881, he fought against the British and defeated them at Majuba Hill. He was first elected president of the republic in 1883 and was re-elected in 1888, in 1893, and in 1898. Both in statesmanship and diplomacy he exhibited recognized ability. His policies, however, were designed to consolidate Boer political gains, to the exclusion of the British *uitlanders,* and to extend the Transvaal territory to the sea. He led the Boers against the British in the Anglo-Boer War of 1899-1902, in which the forces of the Transvaal Republic and the Orange Free State were allied. Pressed by the British advances, he left Pretoria, sailing for Europe on Oct. 19, 1900, in a futile attempt to gain military support against the British.

Krupp (*krōōp*), ALFRED, arms manufacturer, born in Essen, Germany, April 26, 1812; died July 14, 1887. His father, FRIEDRICH KRUPP (1787-1826), discovered the art of making cast steel, and at his death a small forge and shop were left for the support of his family. Alfred took charge of it and, in 1848, discovered a method of casting steel in large masses. He erected the first steam forging hammer employed in Germany. The factory soon became one of the most important in Europe and produced engines, rails, car wheels, and heavy armaments. In 1861 the Prussian army adopted his breech-loading rifle, and, by the late 19th century, the Krupp armament works had become the mightiest weapons arsenal in the world. Besides the extensive gun plant, Krupp acquired large mines and collieries in Germany and foreign countries. The Krupp plant covered an area of over 1,000 acres but was hard hit in World War II. In 1864 letters of nobility were tendered Krupp, which he declined. FRIEDRICH ALFRED KRUPP (1854-1902) succeeded to the general management after the death of his father. GUSTAV VON BOHLEN-HALBACH (1870-1950) married BERTHA KRUPP (1886-1957), heiress to the family holdings in 1906, and was permitted to take the name GUSTAV KRUPP VON BOHLEN-HALBACH. He assumed control of the company in 1910 and continued in this capacity until his retirement in 1943. A supporter of Adolf Hitler, he was indicted as a war criminal in 1945, but was not tried because of his old age and ill health. His eldest son ALFRED (1907-) was tried by the International Military Tribunal in 1948, on charges of slave-labor practices during World War II, and was sentenced to 12 years in prison. His sentence was later reviewed by the U.S. High Commission, and he was released in 1951 after serving less than six years. At the same time the larger part of the Krupp properties were returned to the family, with the provision that the coal and steel interests be sold.

Krypton (*krĭp'tŏn*), an inert gaseous element which resembles argon (*q.v.*), discovered in air by William Ramsay in 1898. The element has the atomic number 36, an atomic weight of 83.8, and a boiling point of —153.23° C. Only about one part in 910,000 of the atmosphere consists of krypton. Its chief application is in tubular gaseous lamps of the neon type.

Kuala Lumpur (*kwä'lạ lŏōm'pŏōr*), capital of the Federation of Malaya and the state of Selangor, 200 m. N.W. of Singapore. The city is a commercial center, the chief exports being rubber and tin. Population, in 1950, 225,000.

Kuan Yin (*gwän'yĭn'*) or KWAN YIN, in Chinese mythology, the goddess of mercy. She is the most popular of the Chinese gods, being also the protectress of women and a goddess of fertility. Although Buddhist in origin, she is also found in the Taoist religion and prior to the 12th century was considered to be a male god.

Kuban (*kōō-bän'*), a river of southeastern Russia. It is 584 m. long and navigable for *ca.* 150 m. from its mouth. It rises in the Caucasus Mts., near Mt. Elbruz, and discharges partly into the Black Sea and partly into the Sea of Azov.

Kublai Khan (*kōō'blī kän'*), Mongol emperor of China, grandson of Genghis Khan and founder of the 20th dynasty, that of the Mongols of Yuan, born in Tartary in 1216; died in Peking

KUBLAI KHAN

in 1294. Early in his career, he joined with his brother Mangu Khan and a cousin in expelling the Tartars from China. In 1260 he succeeded his brother Mangu as emperor of the country, and, although he did not directly rule the entire country, the other leaders recognized his overlordship. He expanded the boundaries of China to include Korea and Burma, but he failed in his efforts to conquer Japan. He was noted during his reign as a patron of the arts and literature. Marco Polo (*q.v.*), a famous 13th-century traveler, lived at his court for 17 years.

Kudu (*kōō'dōō*), or KOODOO, a species (*Strepsiceros strepsiceros*) of African antelope (*q.v.*), distinguished by the spiraling horns of the male and a series of narrow vertical white lines on the body.

Kudzu (*kōōd'zōō*), a perennial vine having broad leaves on woody stems and bearing purple flowers. Related to the legumes, it is also a soil-enriching plant, and the thick, low vines are often used as a deterrent to soil erosion. The plant is native to Japan but was introduced to the U.S. and South America in the late 19th century.

Kufa (*kōō'fə*), AL, a town in central Iraq, on the western bank of the Euphrates River, 90 m. s. of Bagdad. Founded in A.D. 638 by the Caliph Omar I, it was one of the leading cities of the Ommiad caliphate in the 7th and 8th centuries, but subsequently declined rapidly in importance. Cufic (or Kufic) writing (*q.v.*) was developed here.

Kuhn (*kōōn*), RICHARD, chemist, born in Vienna, Austria, Dec. 3, 1900. After teaching at the Univ. of Munich (1925) and at Zurich (1926-29), he took up the position of professor and director of the chemical department at the Kaiser Wilhelm (now Max Planck) Inst. for Medical Research at Heidelberg. Kuhn was awarded the 1938 Nobel Prize for chemistry for his work on carotinoids and vitamins but declined it in accordance with the instruction of the German government.

Kuhn, WALT, painter, born in New York City, Oct. 27, 1880; died there, July 13, 1949. After study in various European schools, he began his career as a cartoonist. He was one of the organizers of the International Exhibition of Modern Art (Armory Show) in New York City in 1913, presenting the work of many contemporary masters for the first time in the U.S. In addition to his paintings, represented in many museums, he also decorated night clubs and railroad cars. "Blue Clown," in the Whitney Museum, is among his best known works.

Kuibyshev (*kwē'bi-shĕf*), formerly SAMARA, a city, located at the junction of the Samara River with the Volga, in the southeastern part of the R.S.F.S.R. An excellent river port and rail center, it manufactures machinery, food products, lumber products, leather goods, matches, and flour. It was built in 1586 as a stepping stone to Russia's newly acquired provinces of Kazan and Astrakhan. Kuibyshev was captured by a rebel leader, Stenka Razin, in 1670, and in 1774-75 it was a center of uprisings among the serfs under Pugachev. The Soviet government was moved here temporarily in World War II, during the German attack on Moscow (1941). It is also the capital of the KUIBYSHEV REGION (area, 20,800 sq. m.; pop., 1946, 1,950,000), which is primarily agricultural in character. Population (1946), 600,000.

Ku-Klux Klan (*kū-klŭz' klăn*), a society founded at Pulaski, Tenn., in 1866, in the Reconstruction period after the Civil War. Originally founded as a social club, in 1867 its purpose became to oppose the "carpetbaggers" and the Reconstruction acts and to prevent freedmen from voting. In some cases the Negroes were persecuted and other acts of violence perpetrated. The organization in the period of its greatest strength numbered about 550,000 members, all of whom were people of the Southern states, but its largest membership was in Alabama, Georgia, Kentucky, Mississippi, North and South Carolina, and Tennessee. The members wore white robes and hooded masks to terrify their opponents. An act of Congress passed April 20, 1871, provided suppressive measures, and the society disbanded by 1877.

This organization was revived in 1915, when William J. Simmons, a preacher and traveling salesman, and three survivors of the original Ku-Klux Klan incorporated a new organization as a fraternal order and received a charter from the State of Georgia. It soon became national in its

character and this time directed its attacks not only against Negroes, but against Jews and Catholics as well. After World War I, the group became influential in Southern and Midwestern politics, with a membership of about 500,000. It declined in power, however, in the 1930's, and, although attempts were made to revive it after World War II, the Klan did not regain much influence outside of a few Southern states. Legislation has been passed in many states outlawing the organization.

Kula Gulf (*kōō'lä gŭlf*), a gulf situated between Kolombangara and New Georgia islands, about 157° E. and 8° S., in the Solomons archipelago. The gulf is 17 m. long and 10 m. wide.

Kula was the scene of important sea engagements during World War II (July 5 and 13, 1943), when a numerically inferior American task force outshot a Japanese force. The U.S. fleet's primary objective at Kula Gulf was to draw out the Japanese fleet and engage it in battle. By August 1943 the area was in American hands.

Kulak (*kōō'läk*), in Russia, term for well-to-do peasants who, prior to the Communist redistribution of land, held the larger farms. During the second Five-Year Plan, the kulaks were expelled from their farms, becoming either peasants of less land and wealth or workers on collective farms.

Kullman (*kŏŏl'man*), CHARLES, singer, born in New Haven, Conn., Jan. 13, 1903. A graduate of Yale Univ. (1924), Juilliard School, New York City (1927), and the American Conservatory at Fontainebleau, France, he taught at Smith Coll., Northampton, Mass., during 1928-29. The following year he sang with the American Opera Company and then toured the music centers of Europe. On Dec. 20, 1935, he made his debut as *Faust* at the Metropolitan Opera House, New York City, where he has since been a prominent member, featured in lyric tenor roles.

Kumamoto (*kŏŏ'mä-mô-tō'*), a commercial city of Kyushu, Japan, 50 m. E. of Nagasaki, on the Shira River. It is the capital of the Kumamoto district. The city was founded in the 16th century as a stronghold of feudal Japan, remaining among the most strongly fortified cities until 1877. Kumamoto is an educational center. Population, 1950, 267,506.

Kumasi (*kŏŏ-mäs'ī*), or COOMASSIE, a town of Western Africa, in Ghana, the former Gold Coast. It is located about 150 m. N. of the Gulf of Guinea and has railroad connections with Accra, on the Gulf of Guinea. The town has considerable trade in cereals, livestock, and fruit. Population, in 1948, 78,483.

Kumquat (*kŭm'kwŏt*), or CUMQUAT, a shrublike tree (*Fortunella japonica*), related to the orange, producing a small orange-colored edible fruit. It is native to Cochin China and China, from where it was brought to Japan, California, and Florida for cultivation.

Kuniyoshi (*kŏŏ-nĭ-yō-shĭ'*), YASUO, artist, born in Okayama, Japan, Sept. 1, 1893; died in New York City, May 14, 1953. He came to the U.S. at the age of 13 and studied at art schools in San Francisco and New York. He won recognition, both as a teacher and a painter, and his works are included in many of the leading art collections in the U.S. He received many prizes and medals, including a Guggenheim Fellowship (1935). His early production shows a trend toward impressionism, combined with the style of his native country. Later, he came close to the German expressionists without, however, accepting their serious subject matter, and his work is marked by a certain personal playfulness.

Kuomintang (*kwō-mĭn-täng*), in China, the people's party, founded (1905) by the late Dr. Sun Yat-sen (*q.v.*). Originally revolutionary, it became the Nationalist party under Chiang Kai-shek (*q.v.*). See *China*.

Kurdistan (*kōōr-dĭs-tän'*) or KOORDISTAN, a nonpolitical region of eastern Turkey in Asia, including an area of about 74,000 sq. m. The northern boundary is formed by Armenia and the eastern by Iran, extending into the latter country as far as Lake Urumiah. The inhabitants are principally Kurds, who adhere to the Mohammedan religion but differ from the Turks in language. They are primarily a nomadic, pastoral people. They have opposed the spread of Turkish customs and language, and the Turks have often taken severe measures against them. Cities in this area include Van and Bitlis in Turkey. Population, *ca.* 2,500,000.

Kuriles (*kōō'rēlz*), a group of 32 small islands belonging to Russia. Also known as Chishima Retto, the Kurile Islands are located in the Pacific Ocean, northeast of Nemuro Bay, and extending from the southern point of Kamchatka to the eastern extremity of the island of Hokkaido. The total area of the islands is *ca.* 3,960 sq. m.; among the eight chief islands are Shikotan, Etorofu, and Kunashiri. Of volcanic character, the islands contain many high peaks, dense forest land, and lakes. A unique species of bamboo is grown on the island of Shikotan. Little definite information is known about the aborigines of the Kuriles, the Ainu, or "Hairy People." In 1945, after World War II, the Kuriles were occupied by the Russian army. One part of the Yalta agreement restored the Kuriles to Russia, who had lost the islands to Japan as a result of the Russo-Japanese War (1905). Population, in 1945, 6,000.

Kurland (*kōōr'länd*) or COURLAND. See *Baltic Provinces*.

Kuropatkin (*kŏŏ-rŭ-pät'kyĭn*), ALEXEI NIKOLAYEVITCH, general, born March 16, 1844; died in Shemurino, U.S.S.R., Jan. 23, 1925. He entered the

Czarist army in 1864 and, after serving a brief period in his native country, was transferred to Turkestan, where he became distinguished as a soldier. In 1874 he was sent to Algeria, and two years later he returned to defend Russian interests against the Turks in Turkestan and Samarkand. In the Russo-Turkish War of 1877-78, he served in the regular army, subsequently conducting a campaign against the Tekke-Turkomans. He became lieutenant general in 1890, was made minister of war in 1898, and was promoted to adjutant general in 1902. During the Russo-Japanese War, he had general command of the army in Manchuria. He was defeated in the Battle of Mukden, a series of engagements lasting from Feb. 20 to March 15, 1905, with a loss of about 100,000 men and officers. Soon after, he was recalled to Russia and was succeeded by Gen. Linevitch.

Kuroshio (*kōō'rō-shē'ō*), KUROSIWO, or JAPAN CURRENT, a warm equatorial current formed in the region southeast of Asia. It flows past the east coast of Formosa and Japan and south of the Aleutian Islands, continuing southward to California. Though its effect is not so marked as that of the Gulf Stream, it is important in the modification of climate.

Kurusu (*kōō-rōō-sōō*), SABURO, diplomat, born in Yokohama, Japan, in 1888; died in Tokyo, April 7, 1954. He was graduated (1909) from the Tokyo Commercial Coll. for the consular service and entered the foreign service in 1910. He served as Japanese consul in Chicago (1913) and in Manila (1919). In 1927 he was appointed consul general in Hamburg, Germany, and later held other diplomatic positions. His name is connected with two historical events—the signing of the pact which made Japan a member of the Axis Powers (*q.v.*), and his visit to Washington, D.C., in November 1941. Sent as a special envoy to aid Japanese Ambassador Nomura in his attempt to reconcile the American-Japanese differences regarding China and the Nipponese advances in the Pacific area, he was actually conferring with the U.S. Secretary of State, Cordell Hull (*q.v.*), at the moment when Japanese air forces attacked Pearl Harbor (*q.v.*). Kurusu was married to an American, Alice Little.

Kuskokwim (*kŭs'kô-kwĭm*), a river of Alaska, the second in size of that territory. It rises on the north side of the Alaskan mountains, has a general direction toward the southwest, and after a course of 550 m. flows into Kuskokwim Bay, an inlet from the Bering Sea. The channel is irregular and passes between precipitous rocks in much of its course. About 500 m. are navigable by river boats.

Kuwait (*kŏō-wīt'*), an Arabian principality, since November 1914 an independent state under British protection; located in northeastern Arabia at the northern end of the Persian Gulf and bounded by Saudi Arabia on the S. and W., Iraq on the N.W. and N., and the Persia Gulf on the E. In 1921 the present boundaries of Kuwait were fixed by the treaty of Mohammerah. The State of Kuwait has an area of 1,930 sq. m.; the population (1950) is *ca.* 80,000. The chief seaport and capital, Al Kuwait, was at one time the leading port for the Arabian trade with India. Surrounded by desert land, the city has a good harbor, and its population of about 25,000 is engaged chiefly in commerce and shipbuilding. Large oil fields were discovered in the country in the late 1930's.

Kwajalein (*kwä-ja-lān'*), an atoll in the Pacific, one of the group called the Marshall Islands, which lie in lat. 5°-15° N. and long. 162°-173° E. It it the world's largest atoll, having 38 islets, and is 77 m. long and 25 m. wide at its widest point. The atoll is surrounded by a dotted reef which encloses a large inner lagoon. Kwajalein is one of the western chain known as the Ralik group. Vegetation is very limited, except for coconut palms, bananas, yams, pandanus, and taro. The climate is moist and hot. Fauna is limited, but the waters around the islands are rich in sea food and fish. Population, in 1948, 832.

The atoll was held by the Japanese under a League of Nations mandate and was strongly fortified during World War II. On Feb. 6, 1944, American forces occupied all of Kwajalein Atoll save for a few minor islets where some Japanese were still holding out. Guqewe, Bigy, and Eller Islands were among those taken. The occupation of this atoll brought some 700 sq. m. of the mid-Pacific under U.S. control. All organized Japanese resistance on the atoll ceased on Feb. 8, 1944, thus completing the occupation. Admiral Chester W. Nimitz said that the capture of Kwajalein Atoll quickened the tempo of the Pacific war. See also *World War II.*

Kwangsi (*gwäng'sē*), an inland province of southern China, west of Kwangtung, and, until recently, known as China's poorest, most backward region. Its capital is Yungning (Nanning), and the entire area of the sparsely populated province is 83,985 sq. m. Tropical agriculture exists, with rice as the staple product; other products include wood from such tropical trees as camphor, cinnamon, and wood oil. Tsangwu is the chief commercial city. Transportation has been developed on the Si River. During World War II, southern Kwangsi was a battleground from November 1939 to February 1940, but the Japanese were forced to retreat. Population, in 1953, 19,560,822.

Kwangtung (*gwäng'dŏōng'*), most southerly coastal province of China, lying W. of the South China Sea and N. of the Gulf of Tonking. It also includes Hainan Island, 15 m. S.E. of the

mainland, from which it is separated by Hainan Strait. The province is rich in tungsten, iron, and coal and produces rice, tea, silk, sugar, porcelain, wood, and ivory carvings. Its capital, Canton, was for many years the sole center of Chinese trade with foreign countries. Three seaports of Kwangtung were ceded to foreign countries—Hong Kong to Great Britain, Kwangchowan (Kwangchow) to France, and Macao to Portugal. Kwangchow, however, was returned to China in 1946. The province was a center of revolutionary activities in the Chinese Civil War of 1911. The Japanese occupied it in 1938, but it was liberated in 1944, and for the rest of the war the U.S. maintained air bases in the province. The area of Kwangtung is 85,447 sq. m. Population, in 1953, 34,770,059.

Kweichow (*gwā'jō'*), an inland province in southwest China. High plateau country, cut by tributaries of the Yangtze and the Si rivers, characterize the province. It is rich in mercury and antimony deposits, as well as in coal, copper, silver, lead, and zinc. Its capital is Kweiyang. Area, 68,139 sq. m.; population, in 1953, 15,037,310.

Kyanite (*kī'ā-nīt*), a mineral similar to garnet used in making inkstands, paperweights, and table tops. It varies in color, but blue predominates. The mineral is found primarily in India, as well as in parts of Czechoslovakia, Switzerland, and various parts of the U.S., especially in Virginia and Massachusetts.

Kyne (*kīn*), PETER BERNARD, author, born in San Francisco, Calif., Oct. 12, 1880; died there, Nov. 25, 1957. He attended business college and later worked as a clerk in a general store. In 1898 he served in the Spanish-American War and the Philippine Rebellion. During World War I he was a captain of field artillery. Subsequently he engaged in literary work and published "Cappy Ricks" (1916), "Never the Twain Shall Meet (1923), "Tide of Empire" (1928), and "The Go-Getter" (1922).

Kyoto (*kyō'tō*) or KIOTO, the third-largest city of Japan, in south central Honshu Island, 25 m. N.E. of Osaka. The surrounding country is fertile. About 6 m. from the city is Lake Biwa. The Kamo River divides the city into two nearly equal parts. Kyoto is an educational center, being the seat of Kyoto Imperial Univ. and of a commercial college. It is also noted for its numerous artists and printmakers' studios. As a commercial city, it ranks among the first in Japan, both in exports and imports. The manufactures include silks, clothing, lacquered ware, ivory ornaments, machinery, bronze ornaments, and textiles. Kyoto replaced the old capital, Nara, in A.D. 793. The newly built city was named Heiankyo ("capital of peace and tranquility"), and Emperor Kwammu spared no expense in the construction of buildings of great elegance and magnificence. The city was laid out on the plan of the Chinese capital of the Sui Dynasty: a rectangle surrounded by a moat. Before the city was built, there were already a number of shrines on the site. Among the city's features are the Yasaka Pagoda, the Gion Shrine, the Golden Pavilion, and the Imperial Palace. Because of the wealth of artistic and architectural treasures in and around the city, it was spared by Allied bombers during World War II. With the Meiji restoration in 1868, the capital was moved to Tokyo. Population, in 1950, 1,101,854.

Kyushu (*kyōō'shōō*) or KIUSHU, one of the four principal islands of the Japanese Archipelago, and third largest of the group, having an area of 15,756 sq. m. It is situated in about 129°-132° E. long. and 31°-34° N. lat., off the northern coast of China. The island has a largely mountainous and volcanic terrain, and earthquakes are frequent and destructive. A great part of the island is not arable, but there is intensive cultivation, and food products are an important export. Kyushu's climate is almost tropical, producing rice and palms, as well as some temperate zone produce. Important natural resources include gold, silver, copper, zinc, coal, and iron. Nagasaki is one of the island's principal cities. Population of the island, 1955, 12,937,767.

During World War II carrier aircraft belonging to American forces struck at the island of Kyushu in a daylight raid, March 18, 1945. This attack was in support of the reported invasion of the Kerama Islands, 380 m. to the southwest. B-29's designed and built as strategic bombers were being used for the first time for tactical bombing of the Kyushu air fields in a series of attacks intended to neutralize Japanese air power. The air fields bombed were bases from which Japanese bombers and "suicide" planes were launched against U.S. forces based on Okinawa.

The cities of Nagasaki and Hiroshima, also located on Kyushu, were the targets for the first two atom bombs; Hiroshima on Aug. 6 and Nagasaki on Aug. 9, 1945. On Aug. 14, 1945, Japan surrendered to the Allies.

Kyphosis (*kī-fō'sĭs*), a term used in medicine. See *Scoliosis*.

Kyrie Eleison (*kĭr'ĭ-ē ē-lā'ĭ-sŏn*), a form of prayer, meaning "Lord have mercy." It is used in both Greek and Latin liturgies and occurs in the prayer books and songs of the Anglican and Lutheran churches. In the ordinary Mass of the Roman Catholic Church, it immediately follows the introit and precedes the *Gloria in Excelsis*.

l (*ĕl*), a letter of the Indo-European alphabet, the ninth consonant. In the English, *l* has only one sound but is sometimes silent, as in *calm* and *half*, and is usually classed as a semi-vowel or a liquid. It is made by raising the tip of the tongue and passing the sonant breath through openings on both sides with a thrill or rustle. The letter *r* is more closely allied to *l* than any other letter which is associated with the latter, and the two are often interchanged in various languages. It is considered that *l* is a later modification of *r* in the Indo-European alphabet, *r* often changing to *l*, while *d* also takes the place of *l* in some of the languages.

Laaland (*lä'lăn*), or LOLLAND, an island in the Baltic Sea, belonging to Denmark. It is 36 m. long, about 12 m. wide, and has an area of 465 sq. m. The soil is fertile, producing corn, hops, hemp, and fruit. It has about 50 sq. m. of oak and beech forests. Maribo is the capital and Nakskov is the largest city. Population, *ca.* 75,000.

Laban (*lā'băn*), in the Old Testament, the brother of Rebecca and the father of Leah and Rachel, hence the father-in-law of Jacob.

Labiatae (*lā-bī-ā'tē*), the botanical name of the plants which belong to the mint family. The order embraces 150 genera and 2,800 species, most of which are native to temperate climates. These plants are widely distributed in the continents, including many that are prized for their flowering and economic properties. Among the best known are the thyme, lavender, marjoram, basil, horehound, sage, rosemary, and peppermint. See *Mint.*

Labiche (*lā-bēsh'*), EUGÈNE MARIN, playwright, born in Paris, France, 1815; died in Paris, Jan. 23, 1888. Labiche distinguished himself among French writers of farce by elevating his light comedies almost to the point of social commentary. His still popular "Le Misanthrope et l'Auvergnat" (1852) was the first work in which social satire supplemented the old farce technique, thus opening new vistas to the French comic theater. Labiche was the author of more than a hundred successful plays, and upon his retirement in 1877, published his works in 10 volumes (1878-79). In 1880, he was accorded national recognition with his election to the French Academy.

Lablache (*là-blàsh'*), LUIGI, operatic singer, born in Naples, Italy, Dec. 6, 1794; died there, Jan. 23, 1858. He appeared as a basso singer at the San Carlo Theater of his native city in 1812, and later attained a reputation by appearing at Palermo, Milan, Rome, Turin, and Vienna. In 1830 he sang at Paris, and later at Berlin and St. Petersburg. While at London he gave instruction in singing to Queen Victoria. His voice was a deep bass and has rarely been equaled, either of quality or volume.

Labor (*lā'bēr*), in the theoretical sense, includes all personal service of whatever kind, regardless of by whom rendered, which enters into the production of goods and services. Economists speak of labor as a factor of production which, in combination with capital and sometimes with land, is responsible for the production of commodities and services. Federal data on the size of the labor force include all manner of personal services, professionals and independent businessmen as well as wage and salaried employees. In the popular sense, however, labor is thought of as representing those working for wages and salaries who have no or very slight managerial functions and who are almost wholly dependent upon their jobs for their livelihood.

It is this group we have in mind when we speak of labor problems or the labor movement.

Public interest in labor is naturally great because of the large proportion of the population whose livelihood is derived, directly or indirectly, from wages and salaries. Attention is directed not only to the share of the social product which goes to labor but to all the various incidents of economic life which destroy or impair earning power of individuals and groups. Prior to the development of modern industrialism, workers were much more nearly self-sufficient than they are today and, while their standard of living was doubtless inferior to contemporary standards, they were far less affected by depressions. Industrialism has taken the worker from the country to the city, from agricultural to industrial pursuits, from the ownership of the tools of production to working with tools and machines owned by others, from being his own employer to being a hired hand. At the same time, changing technology has increasingly transferred thought, skill, and intelligence from the man to the machine, so that ever larger percentages of the working classes are engaging in unskilled and semi-skilled occupations.

Industrialism has also intensified the *division of labor;* many people participate in the manufacture of articles, like shoes, which formerly were made by one person working alone. This has increased economic interdependence among all groups in the community. The growth of big business and the development of management systems in large-scale enterprise have also meant a substantial increase in the proportion of white-collar workers to the total.

A major result of the development of industrialism has been the heightening of worker insecurity. Income from the job, which is the main if not the sole source of livelihood, may be cut off because of accidents or disease arising in the course of or out of the employment; seasonal, cyclical, and technological factors constantly carry the threat of unemployment, and the difficulty of saving for old age, along with technological changes which make a worker old occupationally before he is old chronologically, are among the more serious problems facing the worker in contemporary society. Of great importance, too, is the fact that by and large the incomes of employed workers do not enable them to attain living standards conforming to prevailing notions of health and decency.

In the effort to increase job security, raise wages, reduce the hours of work, and improve working conditions, workers have banded together into unions which have sometimes been regarded, though inaccurately, as the descendants of the old craft guilds. In the U.S., unionism dates from the last decade of the 18th century, though the first really permanent organizations were the so-called "new unions" of the 1850's. Unions may be organized along craft lines (for example, the wire weavers) or along semi-industrial or industrial lines (for example, the garment workers and the miners). Today, there are very few strictly craft unions, most of the so-called craft unions being really amalgamations of closely related crafts (for example, the plumbers).

Through these organizations, workers have sought to win concessions from their employers by way of collective bargaining. From time to time, too, workers have turned to politics, workingmen's parties making their appearance on the American scene as early as the 1820's. The policy of the American Federation of Labor (A.F.L.) had been to avoid independent political action, and the federation tried to work within the two-party system. The Congress of Industrial Organizations (C.I.O.), however, engaged in far broader political programs. After the merger of the two organizations (December 1955), the A.F.L.–C.I.O. was expected to be active in politics, although on a nonpartisan basis. Its *C*ommittee *O*n *P*olitical *E*ducation (COPE) was to be financed by voluntary contributions.

Management may also be said to have a labor problem, consisting of the need for securing and retaining, as long as necessary, a body of competent and satisfied employees. This need, first tacitly recognized by the Founders of Scientific Management, has led to the development of the field of personnel administration with its emphasis on sound recruitment and promotion policies, incentive wages, and welfare programs which, in the large enterprises, frequently assume formidable proportions. In the pre-New Deal period, personnel administration was commonly regarded as an antidote to unionism; however, the advantage of proper personnel procedures has received such general recognition that even governmental agencies have embarked on personnel programs.

Government, too, has had to concern itself with the problems of labor. With the passing of time, more and more elaborate labor codes have been enacted by state and Federal governments. Of great interest following World War II was the proposed Full Employment Bill, based on the idea that it is the duty of the government to assure employment opportunities to all those willing and able to work, if private industry does not absorb the total labor force. Labor-management relations, as defined under the National Labor Relations Act (*q.v.*), were redefined by the Labor-Management-Relations Act of 1947.

See *American Federation of Labor; Arbitration; Child Labor; Congress of Industrial Organizations, Gompers, Samuel; Green, William; Hillman, Sidney; Labor Legislation; Lewis, John L.;*

Murray, Philip; Owen, Robert; Strike; Technology; Trade Unions; Yellow Dog Contract.

Labor, DEPARTMENT OF. See *United States, Departments of.*

Labor Day (*lā'bĕr dā*), a legal holiday in many civilized countries. In Canada and the U.S. it occurs on the first Monday in September, but in most countries of Europe it is observed on May 1. Labor Day was first celebrated in a few states in 1886; it has since grown in favor.

Labor Injunction (*lā'bĕr ĭn-jŭngk'shŭn*), in the U.S., an order issued by a court of equity commanding workers or a labor organization to perform or refrain from performing certain acts. State and Federal courts in the U.S. have had the power to issue injunctions affecting disputes to which workers were a party.

The labor injunction, first used in England in 1868, has been used most widely in the U.S. Employed first in several states in the middle 1880's, the injunction attracted nationwide attention as a result of the Debs case in 1894. During the course of a strike led by Eugene Debs (*q.v.*) against the Pullman Co., the union leaders were prohibited by a court injunction from interfering with trains engaged in carrying the mails. Following an appeal, the case was carried to the U.S. Supreme Court, where the lower court was upheld.

Since the Debs case the injunction has been resorted to frequently by employers in their efforts to combat unions and workers' demands for union recognition, for higher wages, and for better working conditions. The labor injunction has been most often sought and employed in curbing such union activities as picketing, boycotts, and strikes. Occasionally "blanket" injunctions, covering a broad range of activities, have been granted.

Although, according to law, the injunction is supposed to be issued solely as a protection for private property, it was extensively used during the four decades following the Debs case as a convenient legal weapon by antilabor employers. Bitterly opposed by labor, the use of the labor injunction by the courts was limited by a number of states. However, not until the passage of the Norris-LaGuardia Act (*q.v.*) by Congress in 1932 did the control of flagrant abuses of the injunction become effective.

The trend represented by the Norris-LaGuardia Act did not limit the Federal government. The Supreme Court held that the government could obtain injunctive relief when it was operating industrial plants. In 1947 the Taft-Hartley Act authorized the Attorney General to petition the courts to enjoin strikes in cases of national emergency and permitted the N.L.R.B. to apply for restraints of secondary boycotts, a provision confirmed and extended to certain picketing by the Labor Reform Law of 1959. See *Labor Legislation; National Labor Relations Act; Strike.*

Labor Legislation (*lā'bĕr lĕj-ĭs-lā'shŭn*), laws, executive orders, administrative rules and regulations, and decisions of courts and administrative agencies relating to the terms of employment, social insurance, and collective bargaining. From faint beginnings early in the 19th century, there has been a tremendous growth of action in this field; today, labor legislation covers substantially all aspects of the relation of the worker to the job and to the employer. Child labor laws, and laws dealing with immigration, convict labor, and licensing are among those which set limits to the classes of labor which may be employed. Chief among the types of legislation affecting terms of employment are those dealing with wages, hours, and working conditions. While the right of states to fix maximum working hours has long been recognized, it was not until 1937 that the Supreme Court specifically upheld the constitutionality of state minimum-wage laws. The major Federal effort in this field is the Fair Labor Standards Act of 1938 (Wage and Hour Law), which has been described as a floor under wages, a ceiling on hours, and a break for children. Except for this law, child labor is subject mainly to state action, since the Child Labor Amendment has not yet been ratified by the necessary number of states. During World War II, maximum-wage rates were fixed by the National War Labor Board, which also had jurisdiction over bonuses, vacations and holidays, premiums for overtime and night work, and labor disputes.

Social insurance includes compensation for industrial accidents and occupational diseases (workmen's compensation), unemployment compensation, and old-age pensions. Workmen's compensation is mainly a state function, though Federal legislation covers certain groups in interstate commerce. The Social Security Act provides grants-in-aid to the states for old-age assistance to the needy aged, a Federal tax on payrolls to stimulate states to pass unemployment-compensation laws, and old-age and survivors' insurance based on joint contributions by workers and employers. The 1946 amendment to the act liberalized the grants-in-aid.

Up to the middle of the 19th century, trade unions were commonly held to be illegal as criminal conspiracies. Since then, by legislation and judicial decisions, unions have passed through the stage of toleration to an era of limited encouragement. Picketing has been protected by the courts as an exercise of the constitutional freedom of communication, as have related activities such as soliciting membership, holding meetings, distributing leaflets, etc. The antitrust laws have been interpreted so as not to apply to most trade-union activities, and the labor injunction has be-

come largely a matter of the past. Most important in this field is the National Labor Relations Act of 1935 which guarantees to workers the right to organize and to bargain collectively through representatives of their own choosing. Employers are forbidden to interfere with, restrain, or coerce workers in the exercise of these rights, and are required to bargain collectively with the representatives of the majority of the workers in the appropriate bargaining unit. Despite these improvements in the status of trade unions, from time to time efforts are made to inhibit the activities of unions and to withdraw some of the privileges granted them.

Thus in 1947, following the postwar wave of strikes, the Taft-Hartley Act was passed, and in 1959, after a Senate committee's exposures of union corruption, the Labor-Management Reporting and Disclosure Act provided additional restrictions. In addition to amending the National Labor Relations Act (*q.v.*), the Taft-Hartley Law provides a method of dealing with major industrial tie-ups.

Where labor disputes, in the opinion of the President, threaten to bring on national emergencies, the President is to appoint a board of inquiry which is to report only the facts of the case, without recommendation. The President may then direct the Attorney General to seek an injunction to maintain the status quo for a 60-day period; thereupon, the President is to reconvene the board of inquiry, which is to report the last position of the parties. Within 15 days thereafter, the National Labor Relations Board is to conduct a secret poll of the employees on the acceptance of the employer's last offer of settlement, following which the injunction is to be dissolved, and presumably the strike may then take place. In effect, this provides a long "cooling-off" period in emergency cases.

The law also permits suits against unions for breach of contract or for damages arising out of secondary boycotts and jurisdictional disputes, makes the check-off illegal unless it is voluntary and revocable, prohibits strikes by government employees, and bans political contributions by unions.

The act passed in 1959 provides a bill of rights for union members, including (*1*) freedom of speech and assembly within the union as well as protection from arbitrary discipline and financial exactions, and making these rights enforceable by civil suit in the Federal courts; (*2*) a requirement that individual labor organizations adopt constitutions and by-laws, which must be filed with the U.S. Secretary of Labor, to whom annual financial reports must also be submitted; (*3*) limitation of the right of a union to assume trusteeship over subordinate bodies; (*4*) direct election of union officers by secret ballot or, in national or international unions, by delegates elected by secret vote; (*5*) the imposition of a fiduciary duty on officers with respect to union funds, embezzlement of which was made a Federal crime; loans to officers are prohibited, and Communists and felons are barred from offices in unions and employer associations; (*6*) authorization of the Secretary of Labor to investigate violations; and (*7*) prohibition of extortionate picketing. Numerous amendments to the National Labor Relations Act were also included in the law.

Considerable attention has been paid to facilitating peaceful settlement of industrial disputes by government intervention. The U.S. Conciliation Service, and corresponding state agencies, have had considerable success in settling disputes by persuading employer and union to negotiate (conciliation) or by acting as intermediaries and getting the parties to agree on specific terms (mediation). The public conciliation services and mediation boards also attempt to persuade disputants to submit their controversies to arbitration and will appoint arbitrators at the request of the parties.

Special machinery has been provided for the settlement of railway labor disputes. Controversies over the interpretation of collective agreements *must* be submitted to arbitration by the Adjustment Boards. Controversies over the terms of new agreements are investigated by the National Mediation Board. If it does not procure agreement, it reports to the President, who may then appoint a special fact-finding board. Strikes and lockouts are forbidden while the board makes its investigation and for 30 days after it makes its report. See also *Labor; Labor Injunction; Norris-LaGuardia Act; Strike.*

Labor Party, AMERICAN (*lā′bēr pär′tĭ, ȧ-mĕr′i-kạn*). See *Political Parties in the U.S.*

Labor Unions (*lā′bēr ūn′yŭnz*). See *American Federation of Labor; Congress of Industrial Organizations; Strike; Trade Union.*

Laboulaye (*là-bōō-lā′*), EDOUARD RENÉ LEFEBVRE DE, jurist and author, born in Paris, France, Jan. 18, 1811; died in Versailles, May 25, 1883. He became a type founder, later gained recognition as a member of the national assembly and opposed the despotism of Napoleon III.

Labour Party (*lā′bēr pär′tĭ*), a political party in England which now advocates a program of socialization by democratic means. It achieved its greatest importance in British politics when, in 1945, it won a landslide victory in the general election of that year.

The party rests largely on trade unions, Socialist societies, and constituency Labour parties. It is governed by an annual conference which elects its administrative authority, the National Executive Committee. The Parliamentary Labour party acts independently of the National Executive Committee but within policy limits established by

Courtesy Press Association, N. Y.

LEADERS OF THE VICTORIOUS LABOUR PARTY AFTER THE ELECTIONS OF 1945

the annual conference. The two are joined, however, through the Trade Union Congress and the Cooperative Union in the National Council of Labour.

What is now the Labour party originated in 1900 as the Labour Representation Committee (LRC), and took its present name in 1906. The way had been prepared for a party of social reform by the Social Democratic Federation (founded 1881); the Fabian Society (1883), which consisted largely of a group of well-known left-wing intellectuals including H.G. Wells, George Bernard Shaw, and Sidney and Beatrice Webb; and the Independent Labour party (ILP), which, under the leadership of James Keir Hardie, had broken off from the Social Democratic Federation in 1893. The ILP, a socialist body, was active in working for improved conditions for labor. Toward this end, it advocated more extensive organization of labor and agitated in trade union circles for the formation of an independent labor party in Parliament. The LRC did not at first advocate outright socialism, but only social reform. However, anti-labor legislation enacted by Parliament between 1900 and 1906 did a great deal to push the new organization closer to socialism as well as greatly increasing its following. The party continued to grow, and after World War I it was reorganized under the New Labour party constitution (1918), drafted by Sidney Webb and Arthur Henderson. The aims of the party were presented in a manifesto, "Labour and the New Social Order," drawn up mainly by Webb, which finally committed the Labour party as a whole to socialism.

The first Labour man to become prime minister was Ramsay MacDonald. He was given power in 1924, but did not have a majority support in Parliament and the government lasted less than a year. Although the party was not in power long enough to make any major reforms, it did succeed in improving housing and conditions for the unemployed. Elected again in 1929 with a plurality, MacDonald failed to carry out party policies, and in the depression crisis of 1931, formed a "National" government with the Conservatives and Liberals. MacDonald's action split the Labour Party and the election of that year was a disaster for the organization as a whole.

George Lansbury succeeded MacDonald as head of the party but he later resigned over a question of foreign policy and Clement Attlee became the leader in 1935. The party gradually regained its strength, but continually opposed any union with the Communist party of Great Britain. In the wartime Coalition Government of 1940, more than 20 Labour leaders were given office, with three becoming cabinet ministers: Attlee, Lord Privy Seal, Dominions Secretary, and Deputy Prime Minister, and later Lord President of the Council; Ernest Bevin, Minister of Labour; and Herbert Morrison, Home Secretary and Minister of Home Security.

In the general election of July 1945, the Labour party won an overwhelming majority for the first time (receiving 413 seats in Parliament to the 189 for the Conservatives). Attlee became prime minister and, supported by an all Labour cabinet, led his party in gradually carrying out the socialist program for which they stood. The first major change was the nationalization of the Bank of England. Next, the coal mines and civil aviation were to be put under government control, and sweeping plans were effected for a national health service and for expanded social security. In foreign affairs, however, the Socialists followed the path laid down by the Conservatives, who returned to power in October 1951.

Labrador (*lăb-rȧ-dôr′*), a peninsula in northeastern North America, situated mainly east and north of Quebec, and forming a part of Newfoundland. It extends from the Strait of Belle Isle to Hudson Strait, is bounded on the west by Ungava and the east by the Atlantic, and has an area of about 110,000 sq. m. The surface in some portions is desolate and rocky, although in other localities there are extensive forests of birch and fir trees. Among the principal streams are the Grand and Northwest Rivers, the latter draining Lake Aswanipi, or Hamilton, which is in Quebec. The coast is rocky and is indented by many bays and fjords. Fish, such as salmon, cod, and trout, are abundant, and the region is visited annually by thousands of fishermen from Canada. The interior contains many valuable fur-bearing animals, among them the otter, marten, fox, bear, wolf, reindeer, and beaver. The winter season lasts some nine months and is very cold, but the summer is moderately warm and adapted to the culture of potatoes and other vegetables. Barley and oats are grown extensively for fodder.

Labrador was visited by the Norsemen in the year 1001, by Cabot in 1498, and by a Portuguese expedition under Cortereal in 1500. In the 11th century it was described by some Norse settlers of Greenland as Helluland, meaning the land of rocks. In 1763 it became a dependency of Newfoundland. The name Labrador was given to the region by the Portuguese, meaning Laborers' Land, and is frequently applied to the entire peninsula between the St. Lawrence and Hudson Bay. In the latter sense it comprises a large part of Quebec and Ungava. Newfoundland received the larger part of Labrador after the boundary dispute in 1927. The boundaries between the Labrador Dependency and the Province of Quebec are the watershed of the rivers flowing into the Atlantic Ocean, the coastal boundaries extending from Blanc Sablon on the south to Cape Chidley on the north. For further details, see *Canada; Newfoundland*. Population, mostly Eskimos and Indians, *ca.* 5,000.

Labradorite (*lăb′rȧ-dôr-īt*), a variety of plagioclase mineral. Plagioclase occurs in feldspar rocks as triclinic crystals which break with a cleavage angle of nearly 90°. Chemically, it is a silicate of aluminum with sodium and calcium. Its specific gravity is 2.7 and its rating on the hardness scale (*q.v.*) is 5 to 7. The labradorite form of plagioclase shows parallel grooves on its cleavage faces, and though gray in mass, these cleavage surfaces are beautifully opalescent, featuring blues and greens, making it desirable for ornamental purposes. Its name comes from Labrador, where the most valuable specimens of this mineral are found.

Labuan (*lä-bo͝o-än′*), an island in the East Indies, situated west of the coast of British Borneo, formerly a crown colony of Great Britain. The area is 30 sq. m. and the surface is mountainous. Coal, timber, sago, honey, and fruits are the chief products. Victoria, the capital, has a population of 1,500. It has a considerable trade with Singapore and Borneo. The island has been a possession of Great Britain since 1844, and is under the government of the British North Borneo Company. Population, *ca.* 8,000.

Laburnum (*lȧ-bûr′nŭm*), a small tree native to the Alps of Europe, now planted in gardens as an ornamental shrub. In May and June it presents a beautiful appearance, every twig and small branch being hung with racemes of brilliant yellow flowers. The wood is so hard and heavy that it sinks in water. It takes a high polish, has a greenish color, and is used largely for ornamental work and knife handles. The seeds are poisonous. Rabbits are so fond of the bark that they damage the tree in the winter.

Labyrinth (*lăb′ĭ-rĭnth*), a construction, usually subterranean, containing numerous rooms

LABYRINTH

In the gardens of Hampton Court Palace, England

Courtesy Brown Bros., N. Y.

and tortuous passages set in a design so intricate as to make egress difficult without a guide. Many buildings of this character probably existed in ancient Greece and Egypt. The celebrated Egyptian labyrinth, situated in a district now known as Fayoum, east of Lake Moeris, was said to have been built by Amenemhe III around 2,300 B.C. It contained 12 courts and 3,000 rooms on two levels and seems to have been used as a mausoleum. No remains have ever been found of the legendary labyrinth of Crete, designed by Daedalus by order of King Minos. The impossible maze of passages was inhabited by the dreaded Minotaur to whom seven Athenian youths and seven maidens were sacrificed every nine years. This was done as vengeance for the death of Minos's son, at the hands of Athenians who begrudged the young man's success at the Panathenaic Festival. Other famous labyrinths were those of Lemnos, Samos, and Clusium, Italy.

Mazes, or garden labyrinths, designed purely for decorative purposes, enjoyed a great vogue in England and France during the 18th century. The pathways were enclosed by thick hedges of hornbeam, yew, holly or privet, and usually set in a parallel geometric form. A labyrinth of great beauty and charm at Versailles employed a pattern of thick blocks of shrubbery, or wildernesses, interspersed with winding alleys. The mazes at Hampton Court Palace and Somerleyton Hall are fine examples of English gardening. Still another type was the mystic maze with mirrors shown at the Columbian Exposition in 1893.

Lac (*lăk*), a natural resin secreted by *Carteria lacca,* a tiny scale insect which lives on various species of trees of the genus Ficus, found in India, Siam, and Indo-China. In India, the trees and insects are cultivated for lac production. The crude product, called "stick lac," collects in encrusted masses on twigs, and is red in color from a dye contained in the bodies of the insects. Formerly this dye was used in coloring fabrics, but it has been replaced by more efficient pigments. The stick lac is washed to remove most of the coloring matter, strained to remove insect bodies and twigs, and then ground into granules called "seed lac." The seed lac is melted, strained again, poured over plates or cylinders, and dried into sheets which are called "shell lac," which is the shellac of commerce, also known as "orange shellac" from the slight color remaining in it. Sodium hypochlorite is used to bleach the orange shellac into white shellac. Among the many uses of shellac are those in the manufacture of certain types of paper, varnishes, lacquers, phonograph records, sealing wax, in engraving and lithography, and as a stiffener in the millinery trade.

Lac, or LAK, a term used in the commerce of the East Indies. It is derived from the Sanskrit word *lakṣa,* meaning 100,000. One lac is equal to 100,000 rupees and 100 lacs make a *crore.*

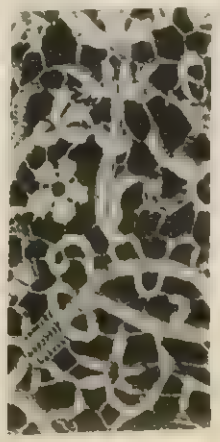
Laccadives (*lăk'ka-dīvz*), a group of small islands in the Arabian Sea, about 200 m. w. of the Malabar coast of British India. They consist of about 20 islands of coral formation and have an area of 745 sq. m. The surface is low and flat and much of it is barren and unproductive. The chief products include coconuts, plantains, and betel nuts. The inhabitants are Mohammedans of Arabian descent, who engage largely in fishing and seamanship. Population, *ca.* 15,000.

Lace (*lāç*), a delicate fabric or network of threads formed of linen, cotton, silk, gold or silver wire, or some other suitable material, forming a fabric of transparent texture. The origin

LACE SAMPLES
(from left to right)

Unfinished needle point lace; Venetian Rose Point, 17th century; Venetian Flat Point, 17th century; Italian *lacis,* with *reticella* edging, 16th century






of lace is unknown, but it was used by the ladies of ancient Greece and Rome. During the Middle Ages the manufacture of lace was an important industry in Italy, whence it was introduced into France. A law passed in England in 1483 prohibited its importation, but in the 16th century the manufacture became quite extensive in Western Europe. Brussels, Alençon, and Maltese are among the best known point laces. They have been produced extensively in Italy, Belgium, and France for many centuries. In the 16th century lace manufactories were established at Honiton, England, and at North Hampton in the 17th century, and in 1768 a machine for manufacturing lace was installed at the latter place.

Many styles of laces are now made, depending upon the mode of manufacture and the purposes for which they are to be used. The finest grades are handmade, these excelling in strength, delicacy, and beauty, and likewise commanding the highest prices. No branch of the textile industry has received more attention than that of lace manufacture, and it is one of the industries in which machine work does not compete in fineness and delicacy with the handmade products. In lace weaving the threads of the weft are twisted around those of the warp. The character of the net and its name are determined by the manner of twisting, as pattern net, spider net, bobbin net, Paris net, and whip net. Point lace was developed from embroidery, and is made largely by needle and a single thread. Guipure lace is made by the crochet needle. It has a network ground on which patterns are wrought in various stitches in silk. The manufacture of gold and silver lace is associated with the ribbon trade. It has for a basis thin ribbons or flat bands, around which yellow and white threads of cotton are wrapped closely. In the lace industry France and Switzerland take high rank. Machine-made imitations of the finer laces are commanding a large sale and taking the place of the more expensive forms.

Lachine (*lä-shēn'*), a town of Quebec, in Jacques Cartier County, 8 m. s.w. of Montreal, on Lake St. Louis. It is on the Canadian National Ry. and is popular as a summer residence for citizens of Montreal, with which it is connected by the Lachine Canal. This canal is maintained to avoid the Lachine Rapids on the St. Lawrence. Extensive electric power works are maintained to supply Montreal. Lachine was settled and so named about 1669. Population, *ca.* 20,000.

Lachlan (*lŏk'lăn*), a river of New South Wales, Australia. It rises in the Blue Mts. and has a length of 700 m. Near Oxley it joins the Murrumbidgee, belonging to the Murray River system. A large part of the course is through a treeless plain, where it becomes almost dry during the dry season.

Lachrymal Gland (*lăk'rĭ-măl glănd*), a small almond-shaped body located in a depression in the upper and outer angle of the eye, between the bone and the eyeball. Its ducts, which secrete the tears, number from 6 to 12 and open on the inner surface of the upper eyelid, near the outer angle. The liquid is spread over the eye by the upper lid and passes to the inner angle of each eye, where it enters a small opening called the *puncta lachrymalis.* This is the commencement of the tear canal. The short canals of the upper and lower lids meet in the nasal sac, from which the nasal duct conducts the tears to the lower part of the nose. The diseases which affect the lachrymal organs include an excessive secretion of tears, obstruction to their escape in the nose, and growths that affect the lachrymal glands.

Lackawanna (*lăk-ä-wŏn'nä*), a river of Pennsylvania, which rises in Susquehanna Cty., and after a course of 40 m. joins the Susquehanna near Pittston. The valley and basin of the Lackawanna River are productive coal fields and produce about one-half the anthracite coal obtained in the U.S. Scranton, the largest city on its banks, is noted for its large factories and blast furnaces.

Laconia (*lä-kō'nĭ-ä*), a city and the county seat of Belknap County, New Hampshire, about 25 m. N. of Concord, on Lake Winnisquam. It is on the Winnepesaukee River and the Boston & Maine R.R. The chief buildings include the public library, the hospital, the post office, the courthouse, and several public schools. It has manufactures of hosiery, machinery, railroad cars, woolen goods, and hardware. Laconia was settled about 1780 and incorporated in 1852. Population, 1900, 8,042; in 1950, 14,745.

Lacquer (*lăk'ĕr*), a protective coating or varnishlike material of various types. The word is derived from the Hindustani *lakh,* referring to the tiny insects which produce lac (*q.v.*). Chinese and Japanese lacquer, in use as early as 1100 B.C., is the sap of a tree, *Rhus verniciflua,* native to southeastern Asia. The tree is tapped in much the same manner as turpentine pines are tapped. The chief constituent of the sap is urushiol, a phenolic substance, which is volatile and may cause skin irritation. The raw lacquer is filtered, evaporated to remove excess moisture, and stored. Another type of varnish tree, *Melanorrhoea usitata,* is found in the East Indies. The lacquer of India is shellac. Shellac must be dissolved in a solvent such as alcohol for use, but Japanese lacquer can be used without solvents. Natural pigments may be added to these lacquers. The Far Eastern lacquers were used in producing notable works of applied art, particularly in decorating table utensils and furniture.

Modern synthetic lacquers are finishes which dry exclusively by solvent evaporation. Generally speaking, the film-forming material in

lacquers is based on a class of resins known as cellulose derivatives. Lacquers may also be formulated with other synthetic resins, such as acrylic and vinyl resins, but most lacquers are formulated with nitrocellulose.

The solvent portion of lacquers is a mixture of ester solvents, ketones, and alcohols. In addition to nitrocellulose and solvent, lacquers also contain a synthetic resin, a plasticizer, and diluent solvents such as aromatic and aliphatic hydrocarbons. The main function of the synthetic resin (usually an alkyd type) is to enhance the properties of the lacquer film, *e.g.*, to improve adhesion, durability, gloss, and resistance to water and chemicals. The plasticizer makes the film flexible to withstand stresses and strains caused by temperature changes and impact. (Common plasticizers used in lacquers are dibutyl phthalate, dioctyl phthalate and tricresyl phosphate, blown castor oil, or special alkyd resins.) The purpose of diluent in the solvent mixture is to serve as a solvent for the synthetic resin in the formulation and, at the same time, to act as a nonsolvent for the cellulose derivative.

Lacquers are produced in clear and pigment types for both exterior and interior applications. Great quantities of lacquer are consumed in industrial finishing (furniture, automobiles, toys, cabinets, etc.). Lacquers are used to coat linoleum or vinyl floor tile, and lacquer coatings also keep certain metal objects from tarnishing.

One of the big advantages of lacquer coatings is their rapid drying characteristics. Lacquers with a higher solid content, sprayed at elevated temperatures in the method known as the hot spray process, are used in finishing furniture, aircraft, and automobile parts.

La Crosse (*lȧ krôs'*), a city in Wisconsin, county seat of La Crosse County, at the junction of the La Crosse, the Black, and the Mississippi rivers. It is on the Chicago & North Western and other railroads. The surrounding country is agricultural and is noted for dairying and for outstanding work in soil erosion control. Among the noteworthy buildings are the Teachers Coll., the Exchange Building, and the four hospitals. There are numerous parks, playgrounds, and swimming pools. The manufactures include flour, farm machinery, brooms, clothing, beer, rubber footwear, air conditioning equipment, trailers, and machine and automobile parts. The first settlement was made in 1841, and La Crosse was incorporated in 1856. Population, 1930, 39,614; in 1940, 42,707; in 1950, 47,535.

Lacrosse, a game at ball which was originated among the Indians of North America. It is played similarly to football, differing from the latter in that the players endeavor to carry or throw the ball to their opponents' goal on a peculiar bat called *crosse*. The bat consists of a long staff, covered at the end, and has a network which reaches about halfway, becoming narrower as it approaches the hand. In lacrosse, as played at present, the crosse is 5 or 6 ft. long and the widest part does not exceed 1 ft. The field is 125 yds. long, at each end of which are two goals, which are surrounded by lines called the *crease*, drawn 6 ft. outside the posts. Each of the two sides has 12 players. In 1867 the National Lacrosse Association of Canada was organized and the game has been steadily gaining in popularity. It is now classed among the international games.

Lacteals (*lăe'tê-ȧlz*). See *Lymphatic System*.

Lactic Acid (*lăk'tĭk ăs'ĭd*), a product of the decomposition of sugar in solution, induced by the presence of certain albuminous ferments. It is formed in milk when it turns sour, hence is found in buttermilk. The change of sweet to sour milk is called the *lactic fermentation* and lactic acid is a product of this change. Scheele originally discovered this acid in sour milk, whence he named it lactic, but it is also obtained from the juices of many vegetables and from the fluids of the stomach and flesh of animals. The salts formed by this acid with bases are called *lactates*. The only one of importance is the lactate of iron, which is employed extensively as a tonic and a stimulant.

Lactometer (*lăk-tŏm'ê-tĕr*), an instrument for determining the specific gravity of milk (*q.v.*). It is a special form of a hydrometer and consists of a glass tube about 1 ft. in length having three clearly distinguishable parts: a long narrow section having a graduated scale of specific gravity values, an expanded portion ¼ in. to 1 in. in diameter and 4 in. to 6 in. long sealed at one end to the tube bearing the scale and at the other end to a round or pear-shaped bulb containing some metal such as mercury or lead, as a weight. In operation, the lactometer is placed in a sample of milk and the bulb and expanded portion of the tube are completely submerged while the surface of the milk stands at a definite level on the graduated scale on the narrow tube. The reading at this height is the specific gravity of the milk.

The two types of lactometers in common use are the Quevenne and the New York Board of Health lactometers. They differ from one another primarily in the scale employed.

Lactose (*lăe'tôs*), MILK SUGAR, LACTIN, SACCHARUM LACTIS, $C_{12}H_{22}O_{11}.H_2O$, a white powder or crystalline mass with sweet taste. It is obtained by treating milk with rennet, evaporating, and crystallizing out the lactose. It is used in infant foods, pharmacy, bacteriology, and in the food industries.

Ladd (*lăd*), GEORGE TRUMBULL, educator and author, born in Painesville, O., Jan. 19, 1842. He studied at Western Reserve Coll. from which he was graduated in 1864, and subsequently at the Andover Theological Seminary. In 1869 he became pastor of a Congregational church at Milwaukee, Wis., and two years later was made professor of philosophy at Bowdoin Coll. For some time he was lecturer on systematic theology at Andover Theological Seminary and, in 1831, was called to the chair of philosophy at Yale. He attained a high reputation as lecturer and was called to Japan and India where he lectured on educational and psychological matters. His chief writings include: "Principles of Church Polity," "Essays on the Higher Education," "Philosophy of Mind," "Outlines of Physiological Psychology," "Philosophy of Conduct," and "Lectures to Teachers on Educational Psychology." He died Aug. 8, 1921.

Ladislas (*lăd'ĭs-lạs*) **II,** JAGELLO, King of Poland, born in 1350; died in 1434. As Jagello, Grand Duke of Lithuania (1377-86), he passed his first five years of leadership in waging a bitter war against the Teutonic Order. In 1386, he married Jadwiga, the Queen of Poland, became King of Poland by election, and embraced Catholicism. As leader of both Polish and Lithuanian forces he defeated the Teutonic Order at Tannenberg in 1410. He later cemented a Russian alliance by making the Russian Princess, Sophia, his fourth wife. It was during his stern and diplomatic regime that Poland first became a great power in the European scene.

Ladoga (*lä'dō-gä*), an extensive lake situated northeast of Leningrad in Russia. It is the largest lake in Europe. The length is 128 m.; breadth, 78 m.; and area, 7,115 sq. m. Into it flow the waters from Lakes Ilmen, Onega, and Saima. It contains a number of rocky islands, the most important being Konevetz and Valaam, the two having an area of about 215 sq. m. The lake is important for its fisheries, navigation facilities, and connection by several canals. At Schlüsselburg near the southwestern part of the lake, the canals unite the mouths of the rivers Volkhov, Syas, and Svir with the Neva River, which carries the discharge of the lake and the rivers mentioned into the Gulf of Finland. Lake Ladoga was important in the Russo-Finnish War (1939-40), and by the treaty between the two countries at Moscow in 1940, Finland ceded territory surrounding the lake, so that the lake became entirely Russian.

Ladrones (*lä-drōnz'*), or MARIANA ISLANDS, a group of islands situated in the Pacific Ocean, east of the Philippines and north of the Carolines. The group includes 15 separate islands, of which Rota, Tinian, Saipan, and Guam are the most important. The area of the entire group is 246 sq. m. They were discovered by Magellan in 1521 and were in the possession of Spain until 1898, when Guam was ceded to the U.S. following the Spanish-American War, and the remainder of the Ladrones, together with the Caroline and Pelew groups, were sold to Germany in 1899 for $4,875,000. At the time of their discovery they had a population of 60,000. At present the entire population is about 47,000, of which *ca.* 40-,000 are Japanese. The inhabitants, originally Chamorros, are now largely Tagals. The Ladrone Islands are divided into two groups. The northern group is actively volcanic, while the southern contains a greater area of fertile soil, though both have timber and tillable land. Agriculture and commerce are the principal industries, but neither is important. The Japanese received the former German islands as a mandate from the League of Nations after the German defeat in World War I. Saipan, the seat of administration, was captured by U.S. forces on July 9, 1944, during World War II, and the remaining Japanese islands were captured at later stages of the war. Guam, occupied by the Japanese early in the war, was retaken by U.S. forces in July 1944. Following the war the islands were occupied by U.S. forces.

Lady (*lā'dĭ*), generally used to denote a gentlewoman, one of refinement, recognized social standing, etc., corresponding to the term *gentleman*. In Great Britain, Lady is an honorary title used by the wife of any peer of lesser position than a duke; also a courtesy title given to the daughters of dukes, marquises and earls.

Ladybird (*lā'dĭ-bûrd*), a class of small insects or beetles found commonly on plants and trees. They are noted for their various colors, such as yellow, red, and black and white variegated. The body is spherical and flat at the lower surface, and the legs and head are small. All of the many species are useful in destroying plant lice. The eggs are laid on the under side of leaves. While both the larvae and the adults feed on plant lice, they also deprive vegetation of some of its juices.

Lady-Day (*lā'dĭ-dā*), originally in the calendar of the Roman Catholic Church, "Our Lady's Day," March 25th or the feast of the annunciation to the Virgin. In England, Lady-Day is also the regular day, occurring quarterly, on which the rent is to be paid.

Lady or the Tiger (*lā'dĭ ôr thē tī'gĕr*), title of a famous short story (1884) by the American humorist, Francis Richard Stockton (1834-1902). This tale has no ending, the reader being left in suspense as to the outcome.

Ladysmith (*lā'dĭ-smĭth*), a town of South Africa, in Natal, 80 m. N.W. of Pietermaritzburg. It is important as a railway junction, being on lines that enter the Transvaal and Orange River colonies, and has a growing trade in live stock,

cereals, and merchandise. The British made it a depot for military stores and supplies prior to the Anglo-Boer War. Gen. White was besieged here from November 1899 until Feb. 28, 1900, when he was relieved by Lord Dundonald. Population, *ca.* 5,000.

Lady's Slipper, a genus of orchids native to the northern latitudes. Ten species are found in North America. The pink lady's slipper and the showy lady's slipper are widely known, the latter being about 2 ft. high. Most species bear beautiful flowers, which have a lip about 2 in. long, this being beautifully veined with rose purple.

Courtesy Mich. Dept. of Conservation

LADY'S SLIPPER

La Farge (*lä-färzh'*), JOHN, artist, born in New York City, Mar. 31, 1835. He studied art in New York and Paris. At first he devoted his attention to drafting on wood and later to the painting of landscapes, portraits, and flowers. In 1869 he was elected a member of the National Acad., and in 1889 received a first-class medal at the Paris Exposition for excellent specimens of stained glass. Soon after he was made a knight of the Legion of Honor. His finest productions include: "St. Paul at Athens," "View Over Newport," and "New England Pasture Land." He executed decorative paintings in St. Thomas' Church and the Church of the Ascension, New York; Trinity Church, Boston, and the battle window in Memorial Hall, Harvard. He died Nov. 14, 1910.

La Farge, JOHN, writer and Roman Catholic priest, born 1880. He is the third son and namesake of the great American painter, John La Farge. He has written a number of significant books on diverse subjects, including: "The Jesuits in Modern Times" (1928), "Interracial Justice" (1937), "Fascism in Government and in Society" (1938), "A Catholic Interracial Program" (1939), "The Race Question and the Negro" (1943), "Secularism's Attack on World Order" (1944). In 1942 he became editor of the Jesuit weekly *America.* He is a talented linguist, speaking a number of languages fluently.

La Farge, OLIVER, writer, born in New York City, 1901, son of the American architect Christopher Grant La Farge. An interest in archeology and American Indians led him to join several expeditions to Guatemala, Arizona, and Mexico. President of the American Association on Indian Affairs since 1937, he distinguished himself as an author with his Pulitzer prize-winning novel, "Laughing Boy" (1929). This was followed by several articles, short stories, and novels, including: "Sparks Fly Upward" (1931), "The Enemy Gods," (1937), "As Long as the Grass Shall Grow" (1940), "The Copper Pot" (1942), and "Raw Material" (1945).

Lafayette (*lä-fi-ĕt'*), a city in west central Indiana, seat of Tippecanoe County, on the Wabash River, 60 m. N.W. of Indianapolis. It is served by the New York Central, the Nickel Plate, the Monon, and other railroads. Lafayette is the seat of Purdue Univ. An industrial and marketing center, the city has diversified manufactures including metal, wood, rubber, electrical, chemical, food, and automotive products, and prefabricated homes. The surrounding agricultural region produces livestock, poultry, dairy products, grains, soybeans, and hay. In 1958 it had a value added by manufacture of $26,878,000. Lafayette is on the site of the French Ft. Quiatenon (1717-91). The battle of Tippecanoe (*q.v.*) was fought 7 m. N. of the city; the site is now a state park. The city was laid out in 1825 and named for the Marquis de Lafayette. It was incorporated in 1854. Population, 1950, 35,568; in 1960, 42,330.

Lafayette (*lä-fä-yĕt'*), MARIE JEAN PAUL ROCH YVES GILBERT MOTIER, MARQUIS DE, general and statesman, born in Auvergne, France, Sept. 6, 1757; died in Paris, May 20, 1834. He was a page to the queen of Louis XV when a boy. At the early age of 16 he married and in the same year entered the army. When the American Revolution excited the sympathy of many high-spirited Frenchmen, he was one of the most friendly to American independence. On April 1777 he sailed from Bordeaux in a vessel equipped at his own expense to aid the Americans, with the nominal disapproval of France. He landed in South Carolina and proceeded northward, receiving an appointment as major general in July. He became an intimate friend of Washington. At the Battle of Brandywine he was wounded, but served at Monmouth and in the Rhode Island campaign, and returned to France in 1779 because of the war with England. However, before the close of the year he returned to America, and was a member of the board of judges in the trial of Maj. André. In 1781 he commanded in Virginia against Arnold and Cornwallis, and returned to France after the close of the war, but made a brief visit to America in 1784.

When the revolution began in France, Lafayette became a prominent factor, and in 1789 introduced in the assembly the celebrated Declaration of Rights, a document modeled after the Declaration of Independence. Soon after he was

Courtesy Metropolitan Museum of Art, N. Y.

MARQUIS DE LAFAYETTE

Painting by Rembrandt Peale (1778-1860)

appointed commander-in-chief of the national guards, and in that capacity saved the king and queen from mob violence, which was threatened at the palace of Versailles. In 1790, when the constitution was adopted, Lafayette resigned his command in the army and retired to his estates at La Grange. He was appointed a major general in 1792, but, after conducting operations on the frontier of Flanders, he was removed by the Jacobins. Escaping to Liége, Belgium, he was taken prisoner by the Prussians and Austrians and remained principally at Olmütz, but was liberated by the efforts of Napoleon in 1797. He became a member of the chamber of deputies in 1818, where he advocated liberal legislation. In 1824 he made a visit to America at the invitation of Congress and was given a triumphant reception. Congress voted him a township of land and a cash fund of $200,000. In the revolution of 1830 he was appointed general of the national guards, and in that capacity aided in securing the throne to Louis Philippe.

Lafayette College, a Presbyterian college for men, established at Easton, Pa., 1826. It is noted for its pioneering work in the introduction of engineering instruction and courses in pedagogy and education. The college's departments include liberal arts, business administration, chemistry, physics, and five fields of engineering—civil, mechanical, electrical, mining, chemical, and international affairs. It is well known for its unique department of civil rights and for the art treasures having to do with American history. The library contains one of the finest collections of material on Lafayette (*q.v.*). The property is valued at $4,750,000 and the endowment is $4,130,000. Annual student enrollment amounts to more than 1,000 and the faculty numbers about 100 teachers and instructors.

Lafayette Escadrille (*lä-fä-yĕt' ĕs-kà-drĭl'*), a group of American airmen who, prior to U.S. entry into World War I, fought for France as a unit of the French Aviation Service. Organized in 1915, this corps of aviators is said to have downed about 30 German aircraft before joining their own country's air forces in April 1917.

Laffite (*là-fĕt'*), or LAFITTE, JEAN, pirate born probably in Bayonne, France, 1780. Laffite came to this country about 1809 and founded a pirate colony on the Baratarian coast south of New Orleans; from this base, he and his men engaged in smuggling and privateering against the Spanish. In 1814, the British tried to buy his assistance in their attack on New Orleans, but he and his pirate band offered their services to Andrew Jackson and fought with the Americans in the ensuing battle. Although the U.S. Government granted pardons to all the Laffite company, they returned to piracy after the War of 1812, basing their activities against the Spanish on the spot which is now Galveston, Tex. The pirate colony grew so large that Laffite was not always able to prevent his men from attacking American ships, and his headquarters were finally (1820) raided by an American warship. In 1825, he and a specially picked crew embarked on a secret mission in his pirate flagship, *The Pride,* and were never seen or heard of again.

La Follette (*lä fŏl'ĕt*), PHILIP FOX, lawyer and politician, born in Madison, Wis., May 8, 1897. The younger son of Robert La Follette, Sr., he studied law at the Univ. of Wisconsin and set up practice in Madison in 1922. He served as a county district attorney (1925-27) and was a lecturer at the Univ. of Wisconsin Law School (1926-30). Twice governor of Wisconsin (1931-33, 1935-39), he continued the Progressive political tradition of his father. During World War II he served on Gen. Douglas MacArthur's staff in the Pacific. La Follette became president of an electronics company in 1955.

La Follette, ROBERT MARION, politician, born in Primrose, Wis., June 14, 1855; died June 25, 1925. In 1879 he was graduated from the Univ. of Wisconsin. The following year he was admitted to the bar at Madison and was soon after elected to the office of district attorney of Dane County, in which position he served until 1884. Subsequently he practiced law, was elected to Congress in 1887, and on retiring from Congress in 1891 he again resumed the practice of law at Madison. He continued active in politics and became the leader of the younger element in his party, known as Half-Breeds, and was opposed to the so-called Stalwarts. In 1900 he was elected governor of Wisconsin and was re-elected in 1902 and 1904. As governor he was an advocate of a primary-election law and reform of taxes on corporations. In 1905, 1910, 1916, and 1922 he was elected U.S.

Courtesy Brown Bros., N. Y.

ROBERT M. LA FOLLETTE

Senator. He was the candidate for President on the Progressive ticket in 1924.

La Follette, ROBERT MARION, JR., legislator, born in Madison, Wis., Feb. 6, 1895. The younger Robert La Follette served his political apprenticeship as secretary (1919-25) to his father, "Fighting Bob" La Follette, and upon the latter's death was elected to fill the senior La Follette's unexpired term as U.S. senator from Wisconsin. He served continuously in the Senate after that time. Politically a Progressive like his father, he was one of the most active of the younger members of the Senate. In 1946 he was most influential in the return of the Progressives to the ranks of the Republican party, but in the election of the same year lost his seat to a Republican nominee.

La Fontaine (*là fŏn-tĕn'*), HENRI, pacifist leader and lawyer, born in Brussels, Belgium, Apr. 22, 1854; died May 27, 1943. After being graduated from the Univ. of Brussels, where he studied law, he remained there as a professor of international law for two years. In 1895 he was elected to the senate as a Social Democrat and later was appointed secretary general of the Belgian League for Arbitration. He soon became active in the Inter-Parliamentary Union, and was made president of its Juridical Commission. The World Congresses of International Associations, held in Brussels in 1910 and 1913, were organized by La Fontaine, and he founded, with Paul Otlet, the Central Office of International Associations. In 1913 he was awarded the Nobel Peace Prize. La Fontaine wrote numerous articles on pacifism, and four books: "Traité de Contrefaçon," "Pasicrisie Internationale," "The Great Solution," and "Bibliography of Peace and Arbitration."

La Fontaine, JEAN DE, author and poet, born in Château-Thierry, France, July 8, 1621; died in Paris, April 13, 1695. He studied in the grammar school of his native town and at the seminary of St.-Magloire. He published a translation of the "Eunuchus" by Terence in 1654 and in 1659 received a pension of 1000 francs from Fouquet for his poem "Adonis." Subsequently he formed a close friendship with Boileau, Molière, and Racine, and was made a member of the French Acad. La Fontaine's intimacy with Molière, Racine, and Boileau gave his writings a profundity which permeates even his amusing but frivolous "Contes et Novelles," and still more his "Fables" (1668-90). Both works were read with enthusiasm by his contemporaries, as were his 11 plays and his poems. Only the "Fables," however, have actually survived. Their content is taken chiefly from older sources, going back as far as antiquity, but the form into which they were brought by La Fontaine, stripped of their pedantry and their original allegorical character, makes them enjoyable even to modern readers.

Lagerlöf (*lä'gĕr-lĕf*), SELMA, author, born at Marbacka, Sweden, Nov. 20, 1858. She studied pedagogy in Stockholm and became a teacher at Landskrona. In 1904 she was awarded the gold prize of the Swedish Acad., in 1907 the Univ. of Upsala gave her the degree of doctor of letters, and in 1909 she was granted the Nobel Prize for literature; five years later she became the first woman member of the Swedish Acad. Her writings added fame to Swedish literature and especially to the Vermland region (east central part). Her writings include: "Miracles of Anti-Christ," "Charlotte Lövensköld," "From a Swedish Homestead," "The Wonderful Adventures of Nils," "Trolls and Men," and "Jerusalem." The book that first made her famous, "Gösta Berling's Saga," 1891, has been translated into many languages. The importance of Selma Lagerlöf's

JEAN DE LA FONTAINE

work transgresses national boundaries. It condenses the emotional feelings of the civilized bourgeois world of Europe. Although set mostly in Sweden, the main characters created by the author belong to the standard literary types of

SELMA LAGERLÖF

Europe between 1895 and World War I, as did those of Ibsen and Bjoernson. She died in 1940.

Lagging (*lăg'ing*), this term most frequently refers to the material (also called *cleading* or *clothing*) used to cover a vessel containing a liquid or gas in order to prevent loss of temperature; it can denote the process itself; it also may refer to horizontal boarding or strips to carry weight in temporary structures. Usual lagging materials are logs, strips, planks, felt, asbestos or other nonconducting substances.

Lagoon (*lä-gōōn'*), a shallow lake connected with the sea or a river. Lagoons are especially prevalent in Italy, Holland, and South America. The term is applied to small ponds in some sections of the country.

Lagomorpha (*lăg-ô-môr'fg*), an order of mammals which includes the hares, cottontails, pikas, and rabbits. The lagomorphs have an ancestral lineage which goes back some 30,000,000 years. They differ from rodents in having four, rather than two, upper incisor teeth.

Lagos (*lā'gôs*), capital and port of Nigeria, on the Bight of Benin, on the western coast of Africa, *ca.* 150 m. E. of Ghana.

First acquired by the British in 1861, Lagos was a separate colony for some time after 1886, until the colony and protectorate of Nigeria was formed in 1914. It was made the capital of the Federation of Nigeria in 1954. The city has an area of 27 sq. m., and its population is *ca.* 272,000. A commercial center of British West Africa, Lagos has rail and air service, an improved harbor, and a flourishing steamship trade. Once a slave-trading center, Lagos now deals in palm oils, cotton lint, cocoa, mahogany, tin ore, and skins of sheep and goats. See *Nigeria.*

La Grange (*lä gränzh'*), a city in western Georgia, county seat of Troup County, and site of La Grange Coll. Named for Lafayette's estate in France, La Grange was incorporated as a city in 1828. During the Civil War it figured as the only town having a company of female soldiers. Its principal industries are cotton and lumber mills. Population, 1950, 25,025.

Lagrange, JOSEPH LOUIS, mathematician, born in Turin, Italy, Jan. 25, 1736; died in Paris, France, Apr. 10, 1813. In 1762 he published his "Calculus of Variations," a work upon which his reputation is based. He secured a prize at the French Acad. in 1764 for his memoir entitled "Libration of the Moon." Napoleon bestowed upon him the cross of the Legion of Honor, made him count, and appointed him a member of the senate. His writings not named above include: "Memoirs on the Motion of Fluids," "Provocation of Sound," "Analytical Mechanics," and "New Method."

La Guardia (*lä gu·är'dī-ä*), FIORELLO H., public official, born in New York City, of Italian parents, 1882; died 1947. He was graduated from New York Univ. in 1910. After practicing law, he entered politics and became a member of the House of Representatives, a service which was interrupted by a two-year term as president of the New York City Board of Aldermen. He returned to Congress later, where he won a reputation as one of the most independent members of the lower house. Probably the most important bill associated with his name is the Norris-La Guardia Bill, limiting the use of injunction in labor dis-

FIORELLO H. LA GUARDIA

CBS Photo

putes. La Guardia was elected mayor of New York City, Nov. 7, 1933, when he administered to the Democratic Tammany organization controlling metropolitan New York the first defeat it had suffered in 20 years. Re-elected three times, he declined to run again in 1945. He then accepted lucrative radio and newspaper contracts, which he continued while he was director of the United Nations Relief and Rehabilitation Administration (1946). His autobiography, "The Making of an Insurgent," was published posthumously in 1948.

La Guayra (*lä gwī'rä*), a city of Venezuela, the principal seaport of that country, 5 m. from Caracas. It is situated on a narrow strip of land along the coast and is important for its harbor and railway connections. It was founded in 1588 and was blockaded by an English and German fleet in 1903, pending the adjustment of some claims against the government of Venezuela. Population, *ca.* 15,000.

Lahore (*lä-hōr'*), a city in Pakistan, capital of West Punjab, on the Ravi River. It is connected by important railroads with many other trade centers. The older part of the city includes 640 acres and is surrounded by brick walls 16 ft. high. Among the principal buildings of Lahore are the fort, which occupies a prominent position, and the Punjab Univ., one of the most noted educational institutions in Pakistan. Other institutions are the Law School, Oriental Coll., Mayo Hospital, Medical School, and Roberts Institute. The Mongol Empire had its seat of government at Lahore, beginning with 1524, and during that period the city attained its greatest prosperity. It became the capital of the Sikhs in 1799, and in 1849 was made the capital of the Punjab. The inhabitants consist largely of Mohammedans, who maintain many mosques and several seminaries. It has an extensive trade in livestock, cereals, and manufactures. Population, *ca.* 650,000.

Laing (*lāng*), ALEXANDER GORDON, traveler, born in Edinburgh, Scotland, Dec. 27, 1793; died in September 1826. He was educated for the profession of a school teacher, but joined the army. In 1820 he went to Sierra Leone, where he was an aide-de-camp to the governor. He returned to England in 1824, was promoted to the rank of major, and placed at the head of an African exploring expedition. The following year he explored the upper course of the Nile, but was strangled by an Arab sheik near Timbuktu, on refusing to embrace the Islam faith.

Laird (*lärd*), JOHN, philosopher, born at Durris, Kincardineshire, Scotland, May 17, 1887; died in Aberdeen, Aug. 5, 1946. He taught philosophy at the Univ. of Aberdeen. Among his published works are "Problems of the Self" (1917),

LAHORE. VIEW OF THE SHALIMAR GARDENS

Courtesy Esso Marketer

"Modern Problems in Philosophy" (1928), "Hume's Philosophy of Human Nature" (1932), "An Enquiry Into Moral Notions" (1935), "Mind and Deity" (1931), and "The Device of Government" (1944).

Laissez-faire (*lā'sā-fâr*), the doctrine advocating a minimum of interference by government in economic and political matters. In England and France early in the 18th century dissenters from the state religion usually controlled commerce, so that religious persecution meant governmental control of commerce and governmental monopoly. To such advocates of *laissez-faire* as the Frenchman Mercier de la Rivière, the doctrine expressed optimistic faith in the power of individual action to promote social good. Politically, it merged with the individualism of the Benthamites, and was supported by Bentham, the two Mills, Herbert Spencer, and in France, Tocqueville. In England, the Manchester School (*q.v.*) of economy, active in the latter part of the 19th century, and headed by Cobden and Bright, stood for complete free trade opposed to imperialistic expansion. Reaching its zenith as an influence in affairs about 1870, *laissez-faire* declined in the 20th century, especially after World War I.

Lake (*lāk*), a sheet or body of water wholly surrounded by land, differing from a pond or lagoon in being deeper and larger. Lakes are very numerous in large bodies of land where rainfall is considerable, as in the equatorial region of Africa, the northern part of the U.S., and the central part of Canada. The greater number of lakes receive and discharge streams of water, hence the water retained within their depressions is fresh. In many warm and dry regions the lakes have no visible outlet, hence the water is salty, such as that in the Caspian Sea and the Great Salt Lake. Some lakes are fed almost entirely by springs. This class receives no inflow from streams and the outflow, though constant in most cases, is not materially large. Some small lakes receive no inflow and have no outlet, the rainfall within the basin being practically equal to the evaporation. Lakes are important in that they supply a water surface for evaporation, thus affecting the rainfall. Some are highly valuable in their fisheries and as avenues for transportation.

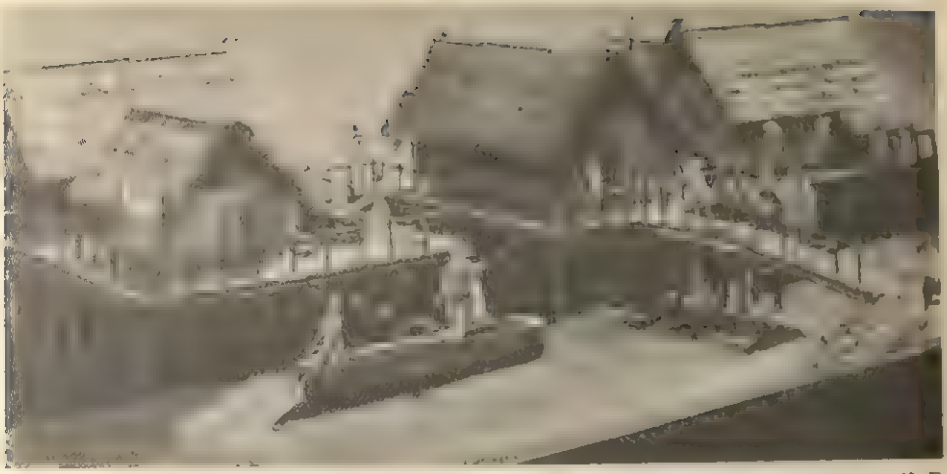
Lake, SIMON, inventor, father of the modern submarine, born in Pleasantville, N.J., Sept. 4, 1866; died June 23, 1945. After studying at the Clinton Liberal Institute at Fort Plain, N.Y., he took a course in mechanical drawing at Franklin Institute and became a partner in his father's foundry. In 1889 he began the manufacture of his patented steering gear, dredges, and other vessel appliances in Baltimore. He built his first submarine five years later, which was followed by his *Argonaut*. Navy authorities refused to consider his vessel, and his third submarine, the *Protector*, was sold to Russia. He went to Europe in 1901 and spent the next seven years there, designing, building, and advising the construction of submarine craft. When he returned to the U.S. he founded the Lake Torpedo Boat Co. in Bridgeport, Conn., and built submarines for the Austrian and American governments. Although World War I brought great activity to his company, Lake still concentrated on his original ideas about the purposes for which submarines should be used—trade and the recovery of sunken treasure. His attempts to recover lost treasures were unsuccessful and in 1934, having lost his money in a concrete block invention, he sold his factory to pay debts, but continued his experimentation in a three-room workshop in a small factory. As the inventor of the even-keel submarine, Lake made one of the most important contributions to the development of underwater craft.

Lake Charles (*lāk chärlz*), a city in Louisiana, capital of Calcasieu Parish, on the Calcasieu River and Lake Charles. The city is served by the Southern Pacific and other railroads. Connected by a direct channel with the Gulf of Mexico, *ca.* 35 m. away, Lake Charles is a major deep-water port. It ships over half of the U.S. exports of rice and the output of the region's oil refineries. Other manufactures are synthetic rubber and chemicals; cattle, timber, and rice are produced in the vicinity. McNeese State Coll. is located here. First settled *ca.* 1800 and made the parish seat in 1852, Lake Charles was incorporated in 1867. Population, 1950, 41,272.

Lake City (*lāk sĭt'ē*), a town of Florida, county seat of Columbia County, 60 m. w. of Jacksonville. It is on the Seaboard Air Line, the Atlantic Coast Line, and the Georgia, Southern & Florida R.R.'s. It is the headquarters of Osceola National Forest and of the only naval stores experiment station in the world. In 1901 it received a new charter as a city. Population, 1940, 5,836; in 1950, 7,571.

Lake District (*lāk dĭs'trĭkt*), a region of England, embracing a portion of Cumberland, Westmoreland, and Lancaster Counties, in which 16 small lakes are situated. The region is a favorite resort for tourists, and has suggested many poetical works to writers of eminence. See also *Lake Poets*.

Lake Dwellings (*lāk dwĕl'ĭngz*), the habitations built by ancient peoples on platforms supported by piles driven into a lake bed or laid on small artificial islands in the lake. This type of construction served a twofold purpose: it allowed the erection of hut villages on marshy land, thereby conserving the little land suitable for farming and pasturage in mountainous areas, and it made the villages easy to



Courtesy American Museum of Natural History, N. Y.

RECONSTRUCTION OF A LAKE DWELLING IN SWITZERLAND

defend because entrance to them could only be gained over a narrow causeway or by canoe.

Evidence of this prehistoric culture is mostly found in the European Alpine regions—Switzerland, northern Italy, Upper Austria, and northwestern Yugoslavia. Among the best remains of these structures are those discovered in Switzerland in 1853. Organic materials preserved by the lake waters provide extensive information about the people who inhabited the lake dwellings. Mainly farmers, the lake dwellers kept domesticated animals, fished with weighted nets, and wove textiles from homespun threads of wool and flax. The uncovering of artifacts identified with the Stone, Bronze and Iron ages offers proof that the pile dwellings were inhabited over a long period of time. Among some South American Indian tribes in the Amazon and Orinoco estuaries, lake dwellings still exist; such dwellings can also be found in western and central Africa, New Guinea, and the Malayan Archipelago.

Lake Edward (*lāk ĕd'wērd*). See *Albert Edward Nyanza.*

Lakeland (*lāk'lạnd*), a city of central Florida, in Polk County, 30 m. E. of Tampa, on the Atlantic Coast Line R.R. Situated in a fertile fruit-growing country, Lakeland is one of the most important citrus-fruit processing and shipping centers in the U.S. Phosphate is mined and cattle are raised in the vicinity. It is the home of Florida Southern Coll. Lakeland was first settled in 1883 and incorporated as a city in 1885. Population, 1930, 18,554; in 1940, 22,068; in 1950, 30,851.

Lake Malar (*lāk mâ'lär*), or MAELAR, the largest lake of Sweden, situated immediately west of Stockholm. It is 70 m. long and from 2 to 20 m. wide. The surface is nearly level with the Baltic Sea, into which it discharges by several channels. It is noted for its navigation facilities and fisheries. Many castles adorn its shores. It contains about 1,200 islands, most of which are wooded.

Lake of the Thousand Islands (*lāk ŏv thē thou'zạnd ī'lạndz*), the name applied to an expansion of the St. Lawrence River, extending from Lake Ontario about 40 m. down the river. It constains about 1,750 islands. Wolf Island is the largest, being about 20 m. long and 7 m. wide.

Lake of the Woods (*lāk of the wŏŏdz*), a lake of North America, bounded by Minnesota, Manitoba, and Ontario, 190 m. N.W. of Lake Superior. It contains a number of wooded islands, is about 65 m. long, and receives the water of Rainy River. The outlet is through the Winnipeg River, by which it is connected with Lake Winnipeg.

Lake Placid (*lāk plăs'ĭd*), situated in Essex County in the northeastern part of New York State in the heart of the famous Adirondack forest preserve at an altitude of 2,000 ft. above sea level. The village itself lies along the shores of Lake Mirror and Lake Placid. Surrounding the village are the highest mountain peaks in the state, Mt. Marcy (Tahawus), 5,344 ft., Whiteface Mountain, 4,872 ft.; McIntyre, Haystack, Colden, and many other lesser peaks. Lake Placid is both a summer and a winter resort, with in-between seasons of fishing for trout, bass, etc. It has long been known as a center for winter sports, and the Olympic winter games of 1932 were held here. Population, 1940, 3,136; in 1950, 2,999.

Lake Poets (*lāk pō'ĕts*), a name sometimes applied to three English poets, Samuel Taylor Coleridge, Robert Southey, and William Wordsworth (*qq.v.*). The three were friends who lived together as neighbors in the lake region of Northern England. Before settling in the lake country, Coleridge and Southey had been associates in an unrealized plan to establish an ideal com-

munity on the banks of the Susquehanna River. Coleridge and Wordsworth had collaborated in producing a volume entitled "Lyrical Ballads" (1798), which is a landmark of the Romantic movement in England. Although the work of the three poets differed greatly, they were friends, they were all identified with the Romantic movement, and they lived together among the lakes. The phrase grouping them was convenient to contemporary reviewers of their works and has been retained by later critics.

Lakes (*lāks*), THE GREAT. See *Great Lakes.*

Lake School (*lāk skōōl*). See *Lake Poets.*

Lakewood (*lāk'wōōd*), a suburb of Cleveland, Ohio, west of the city, on Lake Erie. It is chiefly a residential area. Lakewood was incorporated in 1911. Population, 1940, 69,160; in 1960, 66,154.

Lamaism (*lä'mą-iz'm*), a branch of Buddhism, centered in Tibet (*qq.v.*) but also spread through India, China, and Mongolia. Together with rudiments of various magic cults, certain ideas of Lao-tze and Confucius (*qq.v.*) are interwoven in Lamaism with the teachings of later forms of Buddhism. In contrast to the main branch of Buddhism, its religious contents are inseparably interwoven with a political hierarchy whose head, the highest official of the church, is the Dalai Lama, who traditionally resides in Tibet.

Early Buddhism had developed into the system of the "great vehicle," but it was less this highly spiritual and well articulated doctrine, which originated about the 1st century A.D., than certain rites and ceremonies, incantations and charms, which left their imprint on developing Lamaism. Demons, spirits, gods, and devils began to populate the heavens of Buddhism, and out of this combination of the magic-minded Tantra system and some remainders of original Buddhism, Lamaism developed.

Chinese emperors of the Tang dynasty introduced Buddhism into Tibet in the 7th century and stimulated its development by bringing in Indian teachers. The capital of Tibet, Lhasa, was founded at that time, and many monasteries were established. Spiritual leaders of this period and the group of Chinese emperors and their wives who helped this development later became half-mythological saints of Lamaism, looked upon as incarnations. Secret books imported from India play a great role in Lamaism, although, peculiarly, these books contain a much purer version of Buddhism than is represented in Lamaism. A period of almost 200 years brought persecution to the sect and thus contributed indirectly to the purification of Buddhism and a return to its sources. The greatest political event in the growth of Lamaism was the fact that Kublai Khan (*q.v.*), the grandson of Genghis Khan (*q.v.*), had become converted to Buddhism in its Lamaistic version. At the end of the 13th century, the temporal sovereignty of the lamas of Tibet was stabilized.

A period of quiet development followed until the time of Tsong-kha-pa, who successfully reformed Lamaism by insisting on the purity of the ancient Buddhistic rules. Thus, it was only natural that he tried to expel the magic concepts of the Tantra system. His influence was enormous and almost split Lamaism into two groups. Finally, around 1460, the Emperor of China recognized not only the Dalai Lama but a second, the Panchen Lama, the first traditionally residing in Lhasa, the other also in Tibet. Since then, there are two lamas who rule as sovereigns in Tibet, both considered as incarnations of certain Buddhistic personalities. When the Dalai Lama, who during the last centuries has exercised a certain supremacy, or the Panchen Lama dies, the other, with the help of the abbots of the most highly venerated monasteries, tries to find out in which newborn male baby he has incarnated himself. By a complicated system, one child of all those who are born immediately after the death of the lama is elected and is brought up as a future lama.

Tibetan Lamaism represents the only form of Buddhism where, as in the Catholic Church, worldly power is given to high dignitaries of the religious system. China has always recognized this worldly power over Tibet, much in the same way as the secular powers in Europe have recognized the worldly power of the pope. Both of the lamas, but particularly the Dalai Lama, have almost the function of the Pope and like the Pope they rule politically over their own realm but spiritually over all followers of Lamaism outside Tibet, in China, Japan and India.

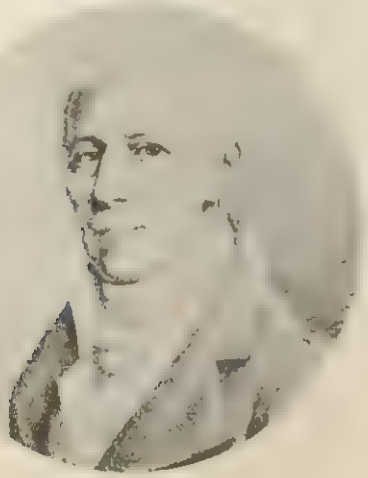
It must be emphasized once again that while Lamaism in the long view is definitely a species of Buddhism, it includes magic elements which are not contained in the original Buddhism. The many monasteries and convents, whose abbots are almost mystical personalities, and the secluded life of the monks and nuns in the Tibetan monasteries contribute much to the emphasis on rites, magical forms and superstitious practices which in some respects debase Lamaism to the level of lower religions and which do not correspond to the pure teachings of general Buddhism.

Lamar (*lą-mär'*), LUCIUS QUINTUS CINCINNATUS, lawyer and statesman, born in Putnam County, Georgia, Sept. 17, 1825; died in Macon, Jan. 23, 1893. He studied at Emory Coll., was admitted to the Georgia bar in 1847, and two years later became professor of mathematics in the Univ. of Mississippi. In 1853 he was elected as a representative to the state legislature of Georgia, and, in 1856, became a member of Congress for Mississippi, where he had settled in

1855. At the beginning of the Civil War he resigned and entered the Confederate Army and later was sent as a special commissioner to Europe. He returned to America early in 1864 and served for some time in the Third Army Corps. In 1866 he was elected professor of political economy in the Univ. of Mississippi, where he taught until 1872, when he was again elected to Congress. He was re-elected in 1874 and became U.S. Senator in 1877, serving until 1885, when he became Secretary of the Interior under President Cleveland. In 1888 he became Associate Justice of the U.S. Supreme Court, serving in that position until his death.

Lamarck (*là-mârk'*), JEAN BAPTISTE PIERRE ANTOINE DE MONET, CHEVALIER DE, naturalist and evolutionist, born in Bazantin, France, Aug. 1, 1744; died Dec. 18, 1829. He was the 11th child in an old Picard family with land but slight financial means. He studied for the priesthood with the Jesuits at Amiens, but on his father's death left to join the army at about the age of 17. Brilliant conduct in battle gained him a commission almost immediately; however, an injury forced him to give up a military career shortly thereafter. He then embarked on the study of medicine, in Paris, supporting himself by working in a banker's office. Although greatly interested in several sciences, including meteorology, chemistry, and zoology, he finally determined to specialize in botany. His initial study, entitled "Flore Française" (3 vols., 1778), gained him immediate recognition and membership in the Acad. of Sciences. An appointment as royal botanist enabled him to travel over Europe making botanical observations, and, in 1788, he was attached to the Royal Garden in Paris, afterward known as the "Jardin des Plantes." Lamarck's reputation as a botanist is based on his voluminous works, the "Dictionnaire de Botanique" and "Illustrations de Genres." Changes in the organization and functions of the Royal Garden caused him to be given a chair in zoology at the Paris Museum of Natural History (1793). Thus, comparatively late in life, he shifted his full attention to the study of another science, one in which he was to achieve great renown. His "Système des animaux sans vertèbres" and "Philosophie Zoologique" were published in 1801 and 1809, respectively, but his greatest zoological work was the monumental "Histoire naturelle des animaux sans vertèbres" (1815-22). The latter part of this work was published with the assistance of his daughter and P.A. Latreille, for Lamarck had begun to suffer from a disease which resulted in total blindness.

JEAN BAPTISTE LAMARCK



Although Lamarck made some erroneous deductions because of the limited scientific knowledge of his times and his own failure to adhere to a strict experimental basis, he was the most outstanding zoologist of his period, and many of his theories still hold true.

According to the Lamarckian view, each organism is modified by its contacts with its environment, and these acquired characteristics are subsequently transmitted to the offspring. In other words, if acquired traits are inherited then evolution can take place through an inheritance of modifications. Lamarck's ideas had great appeal in the early part of the 19th century, and the theory was not abandoned until it was proved through the study of mutations and pure lines that acquired characteristics are not inherited. Lamarck deserves much credit for attempting to explain evolution at a time when the theory itself was not yet accepted by most biologists.

Lamarr (*la mar'*), HEDY, motion picture actress, born in Vienna, Austria. Before coming to America in 1937, she starred in Austrian stage and screen plays, including, at 16 years of age, "Ecstasy." Among her recent American films are "Her Highness and the Bellboy," "White Cargo" and "The Conspirators."

Lamartine (*là-mär-tén'*), ALPHONSE MARIE LOUIS DE, statesman and author, born in Mâcon, France, Oct. 21, 1790; died Feb. 28, 1869. He studied at Lyons and Belley, and showed particular interest in poetical literature and travel. In 1811 he made a tour of Italy, where he resided much of the time after 1815. He published his "Poetical Meditations" in 1820. In the same year he was attached to the legation at Naples, where he married Eliza Birch, a wealthy English lady. He became secretary of legation at Florence in 1824, and in 1829 secured an election to the French Acad. Three years later he traveled in the East, but while at Jerusalem was notified of his election to the chamber of deputies and soon after returned to Paris, where he took an interest

Courtesy Brown Bros., N. Y.

ALPHONSE DE LAMARTINE

Courtesy British Information Services, N. Y.

CHARLES LAMB

in political affairs and pursued his literary studies. In the Revolution of 1848 he was a member of the provisional government that formed the republic, of which he became the first minister of foreign affairs. However, he lost favor and in 1851 withdrew from public affairs, engaging after that wholly in literary work. The government granted him a pension in 1867. His best writings include: "History of the Girondins," "History of the Revolution of 1848," "History of Turkey," "Restoration of Monarchy in France," and "Harmonies, Political and Religious."

Lamb (*lăm*). See *Sheep.*

Lamb, CHARLES, essayist and critic, born in London, England, Feb. 10, 1775; died there Dec. 27, 1834. The son of a pannier and general factotum to Samuel Salt of the Inner Temple, Charles, as well as his sister *Mary Anne* (1764-1847), early acquired a taste for the old English writings in Salt's library and made acquaintance with the theater. Charles attended Christ's Hospital as a scholarship student for eight years and was then apprenticed as a clerk first in the South Seas House and then in the East India House, where he was to remain for 33 years. About this time he began to write sonnets and humorous essays for the *Morning Post* and contributed to Coleridge's volume of "Poems on Various Subjects" (1796), also to other volumes published by Southey and Charles Lloyd. Lamb's short prose tale, "Rosamund Gray," reflected the unhappy illnesses and financial reverses of his own family. After 1800, he began to collaborate with Mary Anne, who was permanently consigned to his care after a particularly violent attack of insanity in which she had killed her mother. The ties between brother and sister were very close, and the significance of Mary Anne's continued influence on and aid with Charles' writings has never been fully recognized, partly because her name did not always appear. They shared in publishing several works, among them the celebrated "Tales from Shakespeare" (1807), for which Charles wrote the tragedies and Mary Anne, the comedies. Mary Anne may have given substantial help in preparing "Specimens of English Dramatic Poets who Lived About the Time of Shakespeare" (1808), a work which did much to establish Charles' reputation as a critic. Charles published the "Adventures of Ulysses" (1808), and Mary Anne is thought to be entirely responsible for a collection of children's stories entitled "Mrs. Leicester's School" and a volume of "Poetry for Children."

The Lambs were famous for their informal evenings at home and undoubtedly exerted an important social influence on their intellectual contemporaries. They were closely associated with many of the outstanding literary and artistic figures of the period, notably Lamb's former school fellow and dear friend, Coleridge, also Southey, Wordsworth, James White, Sarah Stoddart, William Hazlitt, William Godwin, and Leigh Hunt. Charles was noted as a conversationalist and for his mastery of the art of letter writing.

Around 1810, Lamb began to contribute critical essays to various literary journals, including Leigh Hunt's *The Reflector* (1810-11) and the *London Magazine* (1820-25). In the latter were published the famous "Essays of Elia," which represent the finest of his work. The first collected edition of Lamb's writings appeared in 1818. One of the most beloved writers of his day, Lamb attained a wide reputation as a critic and was largely responsible for a revival of interest in the literary figures of the Shakespearean age. He brought new philosophical qualities and discrimination to the art of criticism, and a quaint style flavored with the 17th century reflected his fine humour.

Lamballe (*lăn-băl'*), MARIE THÉRÈSE LOUISE OF SAVOY-CARIGNANO, PRINCESSE DE, victim of the

French Revolution, born in Turin, Italy, Sept. 8, 1749; murdered 1792. After the death of her husband, *Louis Alexandre Stanislaus de Bourbon, Prince de Lamballe,* she was chosen as a companion by Marie Antoinette. The two became close friends, particularly after 1785, when the queen took advantage of Madame de Lamballe's salon to influence members of the assembly. The princess made a trip to England to seek aid for the royal family but returned to France and was confined with them in The Temple in August 1792. Following her refusal to deny allegiance to the monarchy, she was transferred to the prison of La Force and cut to pieces by the mob (Sept. 3, 1792); portions of her body were paraded before the eyes of the royal family.

Lambayeque (*lăm-bä-yä'kâ*), a town in Peru, capital of the department of Lambayeque, 6 m. from the Pacific Ocean. It is surrounded by an agricultural country and has a considerable trade in tobacco, sugar, and cereals. The manufactures include clothing, boots and shoes, and cotton and woolen textiles. Population, *ca.* 10,000.

Lambert (*lăm'bĕrt*), JOHANN HEINRICH, philosopher, astronomer, and mathematician, born in Mühlhausen, Germany, Aug. 29, 1728; died in Berlin, Sept. 25, 1777. Through considerable research in the fields of light, color, and heat, he discovered a basis for measuring light. For this reason, the lambert, a unit of brightness, was named after him. Lambert also did extensive research on the motion of planets and the expansion of air. In 1764 he became a member of the Academy of Science and of the Council of Architecture. In 1774 he edited the *Astronomical Almanac.*

Lambertville (*lăm'bĕrt-vĭl*), a city of New Jersey, in Hunterdon County, on the Delaware River, 15 m. N.W. of Trenton. It is on the Delaware & Raritan Canal and the Pennsylvania R.R., and is connected by a bridge with New Hope, Pa. The manufactures include flatware, hand luggage, hosiery, lace, and ceramics. The place was first incorporated in 1849. Population, 1930, 4,518; in 1940, 4,447; in 1950, 4,477.

Lambeth (*lăm'bĕth*), a metropolitan and parliamentary borough of Southern London, England, on the south bank of the Thames River. Its four subdivisions, North, Kensington, Brixton, and Norwood, each send one member to Parliament. Within the borough, four bridges cross the river. Of these, Waterloo Bridge, which dates back to 1817, is the oldest. Lambeth Palace, London residence of the archbishops of Canterbury since the 12th century, has been the meeting place of the world-famous *Lambeth Conferences* (*q.v.*), attended every 10 years since 1867 by Anglican bishops from the entire world. The ancient 15th century Lollard's Tower is said by some to bear evidence of having been a heretics' prison; others claim that its only purpose was as a water tower. Today the historic borough contains several manufactures, including soap, chemicals, and white lead, and and is the seat of the renowned Doulton pottery works. The English dance, Lambeth Walk, derives its name from this borough. Population, *ca.* 300,000.

Lambeth, BARON OF. See *Lang, Cosmo Gordon.*

Lambeth Conferences (*kŏn'fĕr-ĕns-ez*), periodical assemblies of Anglican bishops (*Pan-Anglican Synods*) who have met since 1867 at Lambeth Palace, the London residence of the archbishop of Canterbury. The third Lambeth Conference proclaimed the Lambeth quadrilateral, a program to unify all Christians. The resolutions of the Lambeth Conferences are not synodical decrees but carry much weight.

Lamech (*lā'mĕk*), in the Old Testament, the representative of the idea of blood revenge; recorded as the first man to have two wives (Genesis 4:19-24).

Lame Duck Amendment (*lām dŭk ä-mĕnd'-mĕnt*), popular term applying to the 20th Amendment of the Constitution of the U.S. (proposed by Sen. George W. Norris, Democrat, of Nebraska), providing that "the terms of the President and Vice President shall end at noon on the twentieth day of January [instead of, as before, March 4], and the terms of Senators and Representatives at noon on the third day of January [instead of March 4], of the years in which such terms would have ended if this article had not been ratified; and the terms of their successors shall then begin." The Amendment was adopted on Feb. 6, 1933.

The popular term derives from the fact that legislators voted out of office (called "lame ducks") in elections held the preceding November, formerly sat in Congress for about four more months though their constituents had withdrawn their confidence.

Lamentations (*lăm-ĕn-tā'shŭnz*), BOOK OF, a book of the Old Testament, written by the prophet Jeremiah. It treats of the destruction of Jerusalem. The style of writing is poetic and the first five chapters are arranged in verses to correspond to the letters in the Hebrew alphabet, which circumstance has led some critics to believe that the fifth and last chapter may have been written by some contemporary of Jeremiah, instead of by the prophet himself. See also *Jeremiah.*

Laminates (*lăm'ĭ-nāts*), materials arranged in thin sheets, or "laminae," bonded to each other. The term is frequently used to refer to a group of plastic materials which consist of layers of cloth, paper, wood, or glass fiber, alternated with films of plastic which are laminated into a single sheet by the use of heat and great pressure.

Laminated coatings are films sealed with ad-

hesive on a backing such as fabric, and may include a pigmented coating, a layer of plastic, and a metallic film, with a final transparent plastic film.

Laminated plywood consists of thin sheets of wood, frequently with the direction of the grain alternating to add strength, bonded together with plastic under pressure and heat.

Laminated glass is also called "safety glass" and is made from two or more sheets of glass sealed together with celluloid, pyroxylin, or other plastics.

Lammergeier (*lăm′ĕr-gī-ĕr*), meaning, in German, lamb vulture, the largest bird of prey native to Europe. The native habitat of this vulture is in the lofty mountains of the southern part of Europe and Asia and the northern part of Africa. It forms a connecting link between the true vultures and eagles, measures 10 ft. between extended wings, and is from 4 to 5 ft. long from the beak to the tail. The lammergeier feeds on both carrion and living prey, including such animals as kids, lambs, chamois, and hares, which it carries to great heights in the mountains. It utilizes the bones of animals as a food by dropping them upon rocks from vast elevations, thereby breaking them into pieces suitable to be swallowed.

Lamont (*lą-mŏnt′*), DANIEL SCOTT, politician, born in Cortland County, New York, Feb. 9, 1851; died in Millbrook, July 23, 1905. He attended Union Coll. Influential in New York State politics, he was attached to the staff of Grover Cleveland when the latter was New York governor and later (1885-89) served as private secretary to him in Washington. Lamont was Secretary of War in 1893-97. He became a vice president of the Northern Pacific Ry. Co. in 1898.

Lamont, ROBERT PATTERSON, engineer, born in Detroit, Mich., Dec. 1, 1867; died in New York, N.Y., Feb. 19, 1948. He studied at Michigan Univ. and after 1891 was associated with contracting and manufacturing enterprises. During the First World War he was chief of a division of the ordnance department in Washington. He then served as president of American Steel Foundries until 1929, when President Hoover appointed him Secretary of Commerce. When he left the office in 1932, he became president of the American Iron and Steel Inst.

Lamont, THOMAS WILLIAM, banker, born in Claverack, N.Y., Sept. 30, 1870; died in Boca Grande, Fla., Feb. 2, 1948. After graduation from Harvard in 1892, Lamont became a reporter for the New York *Tribune* (1893-94). He turned from journalism to banking and was appointed secretary and treasurer, and then vice president, of the Bankers Trust Company in New York City (1903-09). In 1911 he entered the firm of J. P. Morgan & Co., of which he was elected chairman of the board of directors in 1943. He also held important positions in many other banking concerns and corporations. Lamont served as financial adviser at the peace conference of 1919 and at the reparations conferences of 1924 and 1929. He acted as an overseer for Harvard Univ. (1912-25) and was a trustee of the Metropolitan Museum of Art in New York City. Among his philanthropic activities was a gift of $500,000 for the restoration of Canterbury Cathedral in England, which had been damaged in World War II.

Lamp (*lămp*), a device used for the generation of light or heat. The "light" emitted may be either visible or invisible (as ultraviolet or infrared) light. Lamps in general use today are of four different kinds: *oil, gas, electric* or *incandescent,* and *fluorescent.* These are so widely different in nature that it is necessary to consider them separately. See also *Electric Light.*

Oil lamps (the most ancient of all) consist of a *wick,* a combustible oil, and a receptacle for the latter. The oil rises through the wick to provide fuel for the flame. The light is derived from the hot, incandescent, unburned particles of carbon in the flame. The latter may be protected from gusts of air by a glass globe or chimney, open at each end to permit the free entrance of air for combustion; and in some cases the flame is protected by a surrounding wire screen to prevent the igniting of surrounding mixtures of combustible gases (Davy safety lamp).

Gas lamps generate light by heating some substance to a high temperature as a result of the combustion of the gas. In some cases, the unburned carbon particles from the fuel supply are the hot, radiating substance, while in other cases Welsbach mantles (fibrous structures impregnated with oxides of cerium and thorium) are used. These mantles give off a particularly brilliant white light when heated by a hot flame from burning gas. These were widely used before the common use of electricity, and reached their highest development and widest use in the period 1890-1910.

Incandescent lamps employ a tungsten filament (earlier models used a carbon filament) as a source. The filament is heated electrically and is sealed in an evacuated glass bulb or a bulb filled with an inactive gas to protect it from the reaction of surrounding gases. The filament is connected to a source of current through leads sealed into the lamp's base. The emanation of light from the filament is accompanied by release of large amounts of heat, and the emission spectrum (array of colors) is relatively rich in long wave lengths such as red or infrared light. These lamps generate and lose rather large amounts of heat in proportion to the light emitted.

Fluorescent lamps produce light by the electrical excitation of a gas, such as neon or mercury-

vapor, contained in a specially treated glass tube. The tube is lined with a *phosphor* (a mixture of compounds capable of absorbing short wave lengths of light and re-emitting them at longer wave lengths). This substance absorbs the ultraviolet light from the excited vapor and emits it as visible light of a particularly white, soft nature. The operation of a fluorescent lamp is accompanied by the generation of relatively small amounts of heat. For their efficiency and economy, these are at present coming into wider and wider use.

Lamps designed to be carried easily without being extinguished are called lanterns.

Lampblack (*lămp'blăk*), the soot or carbon deposit obtained by the imperfect combustion of petroleum, tar, resin, and other substances containing carbon. In burning the substances for lampblack, it is necessary to shut out the free flow of oxygen so that the flame becomes smoky and the soot accumulates on suspended surfaces. Lampblack is useful in the manufacture of printing inks, shoe blacking, and paint. In preparing lampblack for printing, it is commonly mixed with linseed oil. It is prepared for use in painting by adding linseed oil and white lead.

Lampman (*lămp'mən*), ARCHIBALD, poet, born in Morpeth, Ontario, Nov. 17, 1861; died in Ottawa, Feb. 10, 1899. He was graduated from Trinity Coll., Ontario, in 1882, and began his career as a school teacher. Soon after, he obtained a clerical position in the post office at Ottawa. His complete works were published under the editorship of Duncan Campbell Scott in 1900. Chief among his writings are "Among the Millet, and Other Poems" (1888) and "Lyrics of Earth" (1893).

Lamprey (*lăm'prĭ*), a genus of animals which occupy a place between the eel and fish, differing from the true fish in that they do not possess scales, paired fins, or jaws. In appearance they are eellike, attain a length of nearly 3 ft., and have a mouth in the form of a sucker. Most species have a greenish-brown color. They inhabit both fresh and salt water bodies, occurring in the North and South Temperate Zones, and feed on larvae and worms. They frequently attach themselves by the mouth to other fish to suck the blood. The fresh-water lamprey is smaller than the marine, but both have been used as food for many centuries and are caught by traps baited with flesh or worms.

Lanai (*lä-nä'ē*), an island of Hawaii in Maui County. It is located in the central part of the island group, with Kealaikahiki Channel on the S.E.; Lanai is separated from Molokai Island, on the N., by Kaholi Channel, and from Maui Island, on the E., by Auau Channel. It is the sixth largest island in the group (141 sq. m. in area) and ranks sixth in density of population. Lanai

Model in the American Museum of Natural History

LAMPREY EEL PARASITIC ON A CATFISH

consists largely of rolling hills, reaching a maximum elevation of 3,480 ft. On its southern shore are cliffs of considerable height. Lanai is noted for the high quality of its pineapples, grown on a large plantation covering almost the entire island. Kaumalapau, in the southwest, has a good harbor. Lanai City (pop., 2,746), situated on a plateau in the central section, has about two thirds of the island's population. Captain James Cook (*q.v.*) made a landing at Lanai. Population, 1950, 3,136.

Lancashire (*lăng'kə-shĭr*), a county in northwestern England, having an area of about 1,875 sq. m. Bounded on the W. by the Irish Sea, Lancashire has many seashore resorts and an important coal field. Industrial, thickly populated Lancashire contains the important cities of Liverpool and Manchester with their great cotton manufactures as well as worsteds, woolens, silks, machinery, glass, iron and steel, soap, and shipbuilding. In addition to coal mines, there are also deposits of clay, lead, copper, limestone, iron ore, sandstone, slate, and salt. Lancashire is an important agricultural county, raising dairy cattle, pigs, poultry, wheat, oats, and potatoes. It is the most populous and most heavily industrialized county in the British Isles. The great cities in the south of the county almost form a unit, so closely are they connected by railroads and canals.

In Anglo-Saxon times, Lancashire belonged to the kingdom of Northumbria. The prosperity of the county dates from the Middle Ages, when England became the great wool producing country of Europe. The capital of Lancashire is Lancaster (*q.v.*). Population, 1951, 5,116,013.

Lancaster (*lăn'kăs-tĕr*), a city in Ohio, seat of Fairfield County, on the Hocking River, 30 m. S.E. of Columbus, Ohio. It is on the Chesapeake & Ohio and the Pennsylvania R.R.'s. The surrounding region is agricultural, but it also

produces coal, clay, petroleum, and natural gas. Lancaster's manufactured goods include glassware, flashlights, dry-cell batteries, shoes, farm tools, and machinery. Nearby is the state industrial school for boys. The town was settled in 1800 as New Lancaster, changed its name to Lancaster in 1805, and was incorporated in 1831. It is the birthplace of William Tecumseh Sherman (*q.v.*). Population, 1940, 21,940; in 1950, 24,180.

Lancaster, county seat of Lancaster County, Pennsylvania, on the Conestoga River, 35 m. S.E. of Harrisburg. It is on the Pennsylvania and the Philadelphia & Reading R.R.'s and is the center of one of the wealthiest agricultural counties in the U.S. Farm products include grains, fruits, cattle, dairy products, and tobacco. Lancaster has manufactures of textiles, watches, paper, linoleum, cigars, umbrellas, and iron and steel products. The city's educational institutions include Franklin and Marshall Coll., the theological seminary of the Evangelical and Reformed Church, and Thaddeus Stevens Trade School. "Wheatland," the home of President Buchanan, is preserved as a memorial here. Settled about 1721 and incorporated as a town in 1742, Lancaster was the seat of the Continental Congress in 1777 and the capital of Pennsylvania from 1799 to 1812. In 1818 it was incorporated as a city. Population, 1940, 61,345; in 1950, 63,744.

Lancaster, a city and municipal borough of northwestern England, on the river Lune, 46 m. N. of Liverpool. It is the county seat of Lancashire and has manufactures of textiles, farm machinery, pottery, linoleum, leather, and soap. Formerly an important river port, Lancaster is built on the site of an ancient Roman camp and contains a Norman castle built in 1170. King John granted the first charter to Lancaster in 1193. The city was burned twice by the Scots in the 14th century and changed hands twice in the English civil war. Population, 1951, 51,650.

Lancaster, HOUSE OF, an English royal house. The title goes back to 1267, when King Henry III made his son Edmund, called Edmund Crouchback, earl of Lancaster. The title descended to Edmund's grandson Henry, who died without male heirs in 1361. His daughter Blanche married (1362) the fourth son of Edward III, John of Gaunt, who inherited the Lancastrian property in her right and was made duke of Lancaster in 1362. Henry, the eldest son of John and Blanche, ascended the throne (1399) as Henry IV and was the first Lancastrian king. Later kings of this house were Henry V and Henry VI. The Wars of the Roses grew out of the claims of the rival house of York, which claimed descent from John of Gaunt's two brothers, Lionel, duke of Clarence, and Edmund of Langley, first duke of York. See *England; Roses, Wars of the.*

Lancaster Sound, a channel of the Arctic Ocean, north of Canada, leading from Baffin Bay to Barrow Strait and separating Baffin Island from Devon Island. The sound is about 200 m. long and 65 m. wide and was first discovered (1616) by William Baffin.

Lance (*läns*), a weapon for thrusting, designed to be used in the hand. It was used extensively by the knights of the Middle Ages, who employed it only when mounted. Some of these weapons were as much as 20 ft. long. Napoleon maintained several regiments of lancers, but the Russian Cossacks were the most highly skilled in the use of this weapon. The modern firearms displaced the lance.

Lancelet (*läns'lĕt*), a group name for several cephalochordates of the genus *Branchiostoma,* including the well known *Amphioxus,* which are small translucent marine invertebrates closely related to the vertebrates. The body is laterally compressed, with narrow ventral and dorsal region. The lancelet has a notochord, a smooth elastic rodlike structure forming the principal internal skeleton. Lancelets range from ½ in. to 4 in. long and are found burrowing in the sand. They are widely distributed in shallow waters on the coasts of warm seas. The mouth just protrudes from the burrow. The lips are fringed with ciliated rods which produce a current to bring water to the gills and draw in small swimming organisms for food.

Lancelot (*lăn'sę-lŏt*) or LADISLAUS, king of Naples, born about 1376; died in Naples, Italy, Aug. 6, 1414. He was the son of Charles III, king of Naples and Hungary, and was opposed in his claim to the Neapolitan throne by Louis II of Anjou. However, with the support of Pope Boniface IX, Lancelot succeeded in taking possession of his capital in 1400. In 1403 he tried unsuccessfully to obtain the Hungarian throne. Popes Innocent VII and John XXIII opposed his efforts to unify Italy. In 1413 he sacked Rome and expelled Pope John, but he died before he could consolidate his conquests.

Lancelot of the Lake or LANCELOT DU LAC, in Arthurian legend, one of the bravest of the knights of the Round Table. He was the lover of Queen Guinevere and the father of Galahad.

Lanchow (*lăn-jō'*) or LAN-CHOU, a city of north central China, capital of Kansu province, on the south bank of the Yellow River. The city is about 475 m. N.W. of Chungking and is a major trading center. Population, *ca.* 150,000.

Lancret (*läṅ-krĕ'*), NICOLAS, painter, born in Paris, France, Jan. 22, 1690; died there Sept. 14, 1743. Beginning as a painter of historical scenes, he soon turned to his main topics: the *fêtes champêtres*—typical dance and picnic scenes—and the depictions of comedians on the stage. After the death of his teacher Gillot and that of

Watteau, Lancret became the foremost painter of French court society. His fine pastel colors and airy landscape backgrounds deserve special mention. Many of his paintings were reproduced in copper engravings and sold all over Europe.

Land (*länd*), in law, any soil, ground, or earth whatsoever, regarded as being subject to ownership, and including everything annexed or appertaining to it, whether by nature (resources, trees, water) or by human agency (buildings, fences). Ownership rights extend indefinitely up and down from the surface of the land.

In primitive and nomadic civilizations that live by fishing, hunting, or herding, private ownership of land is unknown. In the early Middle Ages, in Europe, individuals received annual allotments of land for cultivation from the community. Most modern sovereign states claim dominion over all land lying within their territorial limits and reserve the right to seize—upon compensation—privately owned land for public projects. In the U.S.S.R. and in China, the nation owns all land outright and grants provisionally its use to individuals and organizations.

In Western Germany, a *Land* (plural, *Länder*) is the chief administrative subdivision of the country. In medieval times such a district or landgraviate was ruled by a landgrave, or *Landgraf*, a title first assumed by members of the petty nobility in the 12th century. Later such districts were raised to duchies or grand duchies.

Land Crab (*länd kräb*), any of various species of crab that live most of their adult life on land. All return to the sea to breed. Most of them are found in tropical or semitropical countries. They tend to be nocturnal, spending the day in deep holes which they dig. Like all crustaceans, they breathe by means of gills which must be kept moist.

The best known land crab is the robber, or coconut, crab, *Birgus*, of the islands of the Pacific and Indian oceans. This species attains a body length of 18 in. and climbs the trunks of coconut palms for the nuts. In the West Indies the mountain crab, *Gecarcinus*, is often abundant on wooded hillsides several miles from the sea. It has a reputation of swarming through or over houses in its mass migrations to the sea in the breeding season. The land crab of Ceylon, which is troublesome in rice fields, is closely related to the whitish ghost crab, *Ocypode*, that lives in holes on Atlantic beaches from New Jersey southward and scampers over the sand at night scavenging. These timid creatures may attain a width of over 6 in. The common fiddler crab, *Uca*, is essentially a land crab, although its burrows are usually covered at high tide. In parts of Florida there is a species of the hermit crab, *Cenobita diogenes*, living in old snail shells far from the water.

Landes (*länd*), a department of southwestern France, on the Bay of Biscay, covering an area of 3,604 sq. m. Much of it is occupied by a vast, level tract of marshland and sand dunes, extending for over 100 m. along the coast and 40 m. inland. This tract, called Les Landes, has been partly drained and planted with pine woods. Forestry and livestock farming are the chief occupations; there is also a fishing industry. The department is one of the most sparsely populated of France. Its capital is Mont-de-Marsan (pop., 1954, 17,120). Population, 1954, 248,943.

Land-Grant Colleges and Universities. See *Universities and Colleges.*

Landgrave (*länd'grāv*) or LANDGRAF. See *Land.*

Landis (*lān'dīs*), JAMES MCCAULEY, lawyer and government administrator, born in Tokyo, Japan, of American parents, Sept. 25, 1899. A graduate of Harvard Univ. (LL.D., 1925), he was professor of legislation (1928-34) at and dean (1937-46) of the Harvard Law School. He was a member of the Federal Trade Commission (1933-34), chairman of the Securities and Exchange Commission (1935-37), director of Civilian Defense (1941-42), director of American Economic Operations and minister to the Middle East (1943-45), and chairman of the Civil Aeronautics Board (1946-47). In 1961, after Landis submitted a critical survey of Federal regulatory agencies, President John F. Kennedy appointed him special assistant to prepare a program of reform. Landis' books include "The Business of the Supreme Court" (with Justice Felix Frankfurter, 1927) and "The Surrender of King Leopold" (with Joseph Kennedy, 1950).

Landis, KENESAW MOUNTAIN, jurist, born in Millville, Ohio, Nov. 20, 1866; died in Chicago, Ill., Nov. 25, 1944. A graduate of the Union Coll. of Law (now Northwestern Univ. Law School), he was admitted to the bar (1891) and served (1905-22) as U.S. district judge in northern Illinois. He became commissioner of the National and American baseball leagues (1921-44) after a bribery scandal (1919), involving the Chicago Americans and the Cincinnati Nationals.

Land League (*länd lēg*), an organization for agrarian reform, established in 1879 by the Irish Nationalist party under the leadership of Michael Davitt and C. S. Parnell (*qq.v.*). The league conducted a campaign of boycott and organized resistance to the payment of rent but was declared illegal in 1881 by the Liberal government in London (see *Ireland*). Subsequently the National League, a political and agrarian organization, was formed for the purpose of bettering the condition of Irish tenants and advocating home rule for Ireland. The measures advocated by this organization were at least in part met by the Land Purchase Act of 1903, as

amended in 1905 and 1907, under which many holdings were purchased by the actual occupants.

Landon (*lăn'dŭn*), ALFRED MOSSMAN, politician, born at West Middlesex, Pa., Sept. 9, 1887. He attended public schools, removed to Kansas to engage in business at Independence, and after 1912 was an oil producer. During World War I he served in Europe and in 1933 entered politics as a Republican, being elected governor of Kansas, an office he held until 1937. In 1936 he was the Republican nominee for President, and carried Maine and Vermont, but was defeated by F.D. Roosevelt.

Landon, MELVILLE DE LANCEY, humorist, born at Eaton, N.Y., Sept. 7, 1839; died Dec. 16, 1910. He was graduated from Union Coll. and worked for the U.S. Treasury Department, from which he resigned to join the staff of Gen. A.L. Chetlain in the Civil War. His writings are best known under the nom de plume of "Eli Perkins." He published "History of the Franco-Prussian War," "Kings of Platform and Pulpit," "Wit, Humor, and Pathos," "Eli Perkins on Money," "Wit and Humor of the Age," and "Thirty Years of Wit."

Landor (*lăn'dôr*), WALTER SAVAGE, poet and prose writer, born in Warwick, England, Jan. 30, 1775; died in Florence, Italy, Sept. 17, 1864. During his attendance at Trinity Coll., Cambridge, strong republican principles led him to shoot at the windows of a Tory, and although Landor was excused by the authorities, he refused to continue studying for a degree. This same hatred of the Tory party or tyranny in general was to cause him trouble many times during his long life. At the age of 20, he published a small volume of poetry and an anonymous pamphlet entitled "Moral Epistle, respectfully dedicated to Earl Stanhope." Three years later his literary reputation was established by the poem "Gebir," which appeared in several editions, including one in Latin. On his father's death (1805), he came into a large inheritance and for a time lived in Bath where he became a close friend of Robert Southey, the poet. The material for his powerful and majestic tragedy in verse, "Count Julian" (1812), was drawn from a quixotic campaign during which he raised and commanded a cavalry regiment fighting against Napoleon for Spanish independence. Landor was married (1811) to a young authoress, Julia Thuillier, a banker's daughter. After spending three profitless years on an estate which he had purchased in Monmouthshire, Wales, he wandered over France and Italy, living in Tours, Como, Pisa, finally settling for some eight years in Florence. Landor was an enthusiastic classical scholar, and a considerable part of his prolific output in prose and verse (both English and Latin) dealt with ancient subjects. His series of "Imaginary Conversations of Literary Men and Statesmen" began to appear in 1824, and was followed by other outstanding prose works, "The Citation and Examination of William Shakespeare" (1834), "Pericles and Aspasia" (1836), and "The Pentameron" (1837). His chief work in Latin verse was entitled *"Poemata et inscriptiones"* (1847). The "Hellenics" (1847) and "Antony and Octavius" (1856), are representative of the best of his English poetic writing. "The Last Fruit Off an Old Tree" (1853) was a miscellaneous collection of essays, epigrams, and poems. A group of satires in verse, "Dry Sticks Fagoted" (1858), brought on a libel suit and caused Landor to spend the remaining years of his life in Italy. He is noted for his pure, exceedingly terse expression and a singular ability to compose epigrams and satirical pieces. His vigorous yet subtle style resembled the classical but was tinged with a romantic love of nature and sympathy for oppressed peoples. He did not become a popular writer but was greatly admired by a small circle of discriminating friends, including Southey, Browning, Lamb, Swinburne, and Leigh Hunt.

Landowska (*lăn-dôv'ska*), WANDA, harpsichordist and pianist, born in Warsaw, Russian Poland, July 5, 1879; died in Lakeville, Conn., Aug. 16, 1959. She studied at the Warsaw Conservatory and in Berlin, Germany. She began her career as a concert pianist but turned to the harpsichord as her interest in music of the 17th and 18th centuries developed. She settled in Paris, France, in 1900, in the same year in which she married Henry Lew, in cooperation with whom she published *"Musique Ancienne"* in 1909. In 1912, however, she accepted a post especially created for her at the Hochschule für Musik in Berlin, which she held until 1919. Subsequently, she made a series of concert tours

WANDA LANDOWSKA

Courtesy RCA, N. Y.

which took her to Africa, Asia, and North and South America. Her U.S. debut took place in 1923. In 1925 she established a school in a suburb of Paris and remained there, except for her concerts, until 1940. Coming to the U.S., she soon became known as a concert and radio artist and made numerous harpsichord and piano recordings. She was the editor of much of the music she performed and wrote several books (in French) on music of the past.

Landscape (*länd'skāp*), a tract of country, so called with reference to its appearance to the eye from some point of vantage. The term likewise has reference to what may be seen of nature in general, including the country with its groves and streams, as viewed in connection with a portion of the sky. In painting the term is applied to a picture that represents natural scenery, which may or may not include men and animals, though if any animate objects are shown they must appear as subsidiary. Landscape painting is comparatively more recent than that of figure subjects, although in Pompeian painting as well as in early miniature work attempts at landscape painting can be recognized. During the Middle Ages, the traditional gold background in paintings was gradually replaced by landscapes but not until the 17th century did landscape painting develop as an independent branch. Dutch painters, such as Jacob Ruysdael (*q.v.*) and Meyndert Hobbema (1638-1709) may be considered the initiators of modern landscape painting. The 19th century again took up this impetus and distinct schools of landscape painting developed, such as the Düsseldorf school in Germany (Karl Friedrich Lessing, Joseph Anton Koch, etc.), the Romantic school (David Kaspar Friedrich), and in the U.S., the Hudson River school with George Inness as its main representative. In England landscape painting can be traced back to Richard Wilson (1714-82), but it reached a peak with John Constable (*q.v.*). The great French Impressionists of the 19th century naturally favored landscape painting, one of their ideals being to mirror the impressions of nature in their canvases.

Landscape Gardening (*länd'skāp gär'dẹn-ĭng*), the art of laying out grounds so as to produce pleasing effects. It is concerned with arranging drives and walks, planting grass and flowers, constructing bridges and buildings, and setting shrubs and trees so that the whole will form a harmonious combination and lend beauty

LANDSCAPE

Painting by Jacob van Ruysdael (1628-82)

Courtesy Metropolitan Museum of Art, N. Y.

to a lawn or park. This art has been practiced from times immemorial, and many references are made in history to the groves and villas provided by the ancients. However, landscape gardeners who make this work their exclusive business were not commonly employed until in the 19th century. At present many private lawns and parks, as well as public grounds in cities and those surrounding public buildings, are laid out with great care. Shrubs and trees are planted with the view of giving the most pleasing effects, viewed either at close range or from a distance, and various water courses, fountains, and artificial lakes are introduced. See *Gardening*.

Landseer (*lănd'sēr*), SIR EDWIN HENRY, animal painter, born in London, England, Mar. 7, 1802; died there Oct. 1, 1873. He was the son of John Landseer (1769-1852), an eminent engraver, and was taught by his father to sketch animals and natural scenery in his early youth. When he was 13, a number of his productions were exhibited at the academy and attracted marked attention. In 1866 he declined the presidency of the Royal Acad. Among his productions are: "Cat's Paws," "Fighting Dogs Catching Wind," "Return from Deer Stalking," "The Stag at Bay," "High Life and Low Life," "Flood in the Highlands," "Return from Hawking," "Defeat of Comus," "Monarch of the Glen," "Jack in Office," and "Shepherd's Chief Mourner."

Land's End (*lăndz ĕnd*), the most southwesterly cape of England, directly opposite the Scilly Isles. About a mile west of Land's End are the Longships Rocks, on which a modern lighthouse is situated.

Landslide (*lănd'slīd*), or LANDSLIP, the falling or settling of a considerable portion of earth and rocks from a higher to a lower level, frequently causing damage to life and property. Landslides may result from the undercutting action of water to river banks or beaches which collapse with the decay of supporting strata. Heavy rains or melting snows cause landslides, or avalanches, in mountain regions. Other landslides result from earthquake disturbances or engineering construction works. More than a square mile of terrain is sometimes destroyed in a landslide. A particularly interesting and impressive landslide, still prominently visible, gave the present name to Whitewall Mt., at Zealand Notch, N.H.

Landsteiner (*länt'stīn-ēr*), KARL, pathologist, born in Vienna, Austria, June 14, 1868; died June 26, 1943. He received his degree in medicine at the Univ. of Vienna (1891), where he subsequently was instructor in pathology (1909-19). He came to the U.S. and was a member of the Rockefeller Inst. for Medical Research (1922-39). In 1930, he was awarded the Nobel Prize for physiology and medicine in recognition of the

Courtesy Rockefeller Institute for Medical Research, N. Y.

KARL LANDSTEINER

value of his discovery of the four main types of human blood. He also did important research in the fields of immunology, bacteriology, syphillis and poliomyelitis (infantile paralysis) and contributed articles and reports on his work to the leading medical journals.

Lane (*lān*), FRANKLIN KNIGHT, public official, born in Prince Edward Island in 1864; died May 18, 1921. He studied at the Univ. of California and became a successful lawyer in San Francisco. President Theodore Roosevelt appointed him to the Interstate Commerce Commission, as a Democratic member of that body, and in 1913 he was made Secretary of the Interior.

Lane, JOSEPH, soldier and politician, born in Buncombe County, North Carolina, Dec. 14, 1801; died at Roseburg, Ore., Apr. 9, 1881. In 1861 he removed to Indiana, where he was elected to the state legislature in 1822, which office he held until 1846, when he enlisted in the Mexican War, reaching the rank of major general. In 1848 he became governor of Oregon and served as territorial delegate to Congress in 1851-57. He was U.S. Senator in 1859-61. In 1860 he ran for Vice President on the ticket with John C. Breckenridge.

Lane, RALPH NORMAN ANGELL. See *Angell, Norman*.

Lanfranc (*lăn'frănk*), Archbishop of Canterbury, born in Pavia, Italy, about 1005; died in Canterbury, England, May 24, 1089. He was descended from a noble family of Italy, studied law at Pavia and Bologna, and in 1039 founded a law school at Avranches, France. In 1046 he was chosen prior of the monastery of Bec, and in 1066 became prior of the St. Stephen monastery at Caen under appointment of the Duke of Normandy. Four years later he was made bishop of Canterbury, where he exercised much influence on the early church work of England. He pub-

lished "Treatise Against Berengar," "Sermons," and "Commentaries on the Epistles of St. Paul."

Lang (*lăng*), ANDREW, author, born at Selkirk, Scotland, Mar. 31, 1844; died July 21, 1912. He studied at St. Andrews Univ., where he took a deep interest in the classics, and subsequently attended Balliol Coll., Oxford. In 1868 he was elected fellow of Merton Coll., and in 1888 became Gifford lecturer at St. Andrews Univ. Besides translating from the French, he wrote a large number of books in verse and prose and edited many others. His principal writings include "Helen of Troy," "The Mark of Cain," "The Mystery of Mary Stuart," "Letters to Dead Authors," "History of St. Andrews," and "James VI and the Gowrie Mystery."

Lang, BENJAMIN JOHNSON, educator and composer, born in Salem, Mass., Dec. 28, 1837; died Apr. 4, 1909. His father, an organist, instructed him in music, and at 15 he was able to teach and compose. In 1845, he studied in Berlin, Germany, under Franz Liszt, and returned to America the following year to continue his musical engagements. However, he returned to Europe in 1869 and played successfully in Berlin, Leipzig, and other cities, and in 1895 was made conductor of the Handel and Haydn Society. Subsequently he was connected with several musical associations of Harvard Univ., and became popular as a supporter of the music of Wagner. His daughter, Margaret Ruthven Lang (born in 1867), is noted as a composer of delightful songs and instrumental pieces. Her "Witichis" and "Dramatic Overture" are well known.

Lang, COSMO GORDON, Archbishop of Canterbury, born in Aberdeenshire, Scotland, in 1864; died Dec. 5, 1945. Although he originally intended to become a barrister, he gave up the study of law to take orders in the Church of England. He was successively Bishop of Stepney (1901-08), Archbishop of York (1908-28), and Archbishop of Canterbury (1928-42). As a member of the House of Lords he was influential in politics, acting as a member of the royal commission on divorce, and he was much concerned with social work in industrial areas. In 1928, he was an advocate of the revised Prayer Book. He was created 1st Baron of Lambeth in 1942.

Lange (*läng'ĕ*), CHRISTIAN LOUIS, pacifist leader, born in Stavanger, Norway, Sept. 17, 1869; died Dec. 11, 1938. After graduating from the Univ. of Oslo, Lange became active in the movement for the separation of Norway from Sweden. He was secretary-general of the Inter-Parliamentary Union (1909-33), was also prominent in establishing the Norwegian Peace Committee and was active in establishing the Oslo Library and the Nobel Inst. (1904). Lange represented his country at numerous peace conferences and as deputy delegate to the League of Nations Council. He wrote extensively on the subject of peace and, in 1921, he was awarded the Nobel Peace Prize (with Karl Branting). His books include "Parliamentary Government and the Inter-Parliamentary Union" (1911), "Russia, the Revolution and the War" (1917), and "The Inter-Parliamentary Union" (1932).

Langerhans (*läng'ĕr-hänz*), ISLETS OF, in medicine, small cells situated in the tissue of the pancreas which produce insulin (*q.v.*). The German histologist, Ernst Robert Langerhans (1847-88) was the first to define them.

Langland (*läng'land*), WILLIAM, poet, born at Cleobury Mortimer, England, about 1332; died in 1400. It is thought that he studied at Great Malvern and subsequently lived in London. Little is known of his life. He is considered the author of "The Vision of Piers Plowman." It narrates the dreams of Piers Plowman, who, weary of the world, fell asleep beside a stream in a vale among the Malvern Hills, pictures the obstacles which resist the progress of mankind, and presents the simple plowman as the embodiment of virtue and truth. This poem is marked by a regular alliteration instead of rhyme.

Langley (*läng'lĭ*), SAMUEL PIERPONT, astronomer and physicist, born in Roxbury, Mass., Aug. 22, 1834; died Feb. 27, 1906. His education was obtained largely in the Boston Latin School. He was elected assistant at the Harvard Observatory in 1865, and soon after became professor of mathematics in the U.S. Naval Acad. at Annapolis. Two years later he was chosen professor of astronomy at the Western Univ. of Pennsylvania, and subsequently made a number of important observations of eclipses under the auspices of the government. In 1887 he became secretary of the Smithsonian Institution. Among the distinguished honors granted him are the Rumford Medal from the Royal Society of London, a membership in the National Acad. of Sciences and the presidency of the American Assn. for the Advancement of Science. Besides inventing the bolometer, an instrument to note slight changes in temperature, he devised a flying machine. He published "New Astronomy," "Internal Work of the Winds," and "Experiments in Aërodynamics." See also *Aviation.*

Langmuir (*läng'mŭr*), IRVING, chemist and physicist, born in Brooklyn, N.Y., Jan. 31, 1881; died in Falmouth, Mass., Aug. 16, 1957. Educated at Pratt Inst., Columbia Univ., and at the Univ. of Göttingen, Germany, he joined the research staff of the General Electric Co. at Schenectady, N.Y., as a chemist (1909) and was associate director, 1932-50. His major industrial work was that of perfecting the gas-filled incandescent lamp, by greatly increasing its longevity. He also made possible the development of the

Courtesy Press Association, N. Y.

IRVING LANGMUIR

The scientist is shown here inspecting a snow-making machine. At the left is Vincent J. Schaefer of the General Electric Co. and in the center Rear Admiral W. S. Parsons

portable projector for showing films in the home. Langmuir also developed, among other things, the high-vacuum power tube which permitted use of high-voltage in radio transmission, atomic hydrogen welding, a screening-smoke generator used in World War II, and methods for the artificial production of snow and rain from clouds. He was co-formulator, with Gilbert N. Lewis, of the Lewis-Langmuir atomic theory, and was awarded the Nobel Prize for chemistry (1932) "for his discoveries and researches within the realm of surface chemistry."

Langton (*läng'tŭn*), STEPHEN, cardinal and Archbishop of Canterbury, born in Sussex, England, in 1150; died July 9, 1228. He studied at the Univ. of Paris, of which he afterward became chancellor. Pope Innocent III was his personal friend and in 1206 made him cardinal, and the following year consecrated him as archbishop. He was opposed by King John, but, after an interdict was placed upon England and John was excommunicated, Langton was permitted to enter upon his duties, in 1213. The same year he joined the insurgent barons, and gave them enthusiastic support in compelling John to sign the Magna Charta. In 1218 he crowned Henry III, and five years later demanded of him strict compliance with the Magna Charta.

Langtry (*läng'trĭ*), LILLIE, actress, born in the Island of Jersey, off France, in 1852; died Feb. 12, 1929. She was the daughter of a clergyman, married Edward Langtry in 1874, and became known in English society as the "Jersey Lily." In 1881 she made her debut at the Haymarket Theater, London, in "She Stoops to Conquer." The next year she played in America with great success. Her husband died in 1897 and two years later she married Hugo de Bathe. In 1903, she made another tour of America, starring in "The Crossways." Among her successes were those as *Pauline* in "The Lady of Lyons"; as *Hester Grazebrook* in "An Unequal Match"; and as *Rosalind* in "As You Like It."

Language (*läng'gwĭj*), the aggregate of words, gestures, or symbols used by members of a group (tribe, nation, international groups, etc.) for the purpose of communicating with each other. It appeals either to the ear by means of words, tone combinations, rhythms, or to the eye through gestures, pictures, visible symbols, written or printed words. Language is the main tool of intellectual activity, though experiments with anthropoid apes show that it is not absolutely necessary for rudimentary thinking. Language also serves as a medium of art (poetry), of social control (administration, propaganda, persuasion), of emotional release (confession, prayer), and of attempts at magic incantation. Philology, linguistics, and semantics are the sciences that explore language. Modern comparative philology was made possible only when Sanskrit was discovered to be an archaic cognate of nearly all European languages, thus throwing light on their relationship to one another and to a lost parent tongue resembling Sanskrit in many respects. Up to the time of this discovery, at the beginning of the 19th century, philological interest had been confined to the study of grammar, syntax, and the vocabulary of specific languages, especially those known as "classical."

Language is not a product of nature. It exists only in and with human society. Children exposed to solitary confinement, or deserted before reaching the age of speech, do not speak, unless they are specifically taught to do so upon their return into human society. All languages are subject to changes and modifications. It is a mistaken belief that languages change rapidly only among primitive people. Some primitive speech is markedly conservative; on the other hand, among highly civilized races, isolated groups may quickly develop an idiom of their own based on a dialect rapidly diverging in a new environment, from its original form, as in so-called immigrant languages, slang, etc. Primitive tribes are sometimes capable of intentionally developing new languages, a process often observed by missionaries in South America, Africa, and the South Pacific, but the active use of linguistic talent among primitives is variable. There are tribes where men, women, and priests each speak a separate idiom with specialized vocabulary, aside from a common idiom for communication, and where a new idiom may be invented and learned any day. There are other localities where the language has remained nearly the same for more than 250 years. Examples of this are to be found in such places as the French Congo, where 17th-century grammar still exists, or in remote sections of the

Tennessee and Kentucky mountains, where in some details of phonology and vocabulary the language is reminiscent of Elizabethan English. It is also erroneous to believe that because many primitive languages are in a state of observable change, a relatively stable structure and vocabulary are therefore associated with a higher civilization—English has undergone considerable change in the last 500 years, while Icelandic has remained virtually unaltered since the days of the Vikings. Neither richness of grammatical construction nor size of the vocabulary has anything to do with native intelligence or cultural progress. Gothic grammar, for instance, is much more complicated than modern English; also certain languages (like German) which form composite words easily have no need to expand their basic vocabulary by borrowing in order to meet all the demands of a progressive civilization.

The factors that determine the development of a language are both extraneous and intrinsic. Extraneous factors include conquest, immigration, international traffic, vulgarization of "holy" languages, etc. Intrinsic factors are less easily determined. Among the more obvious ones are a tendency to save effort (inertia), and a tendency toward differentiation—the avoidance of monotonously similar sounds or terms. "Thy kingdom come" (four spoken syllables) was in Gothic "qimai thiudinassus theins" (seven spoken syllables). The process of simplification and abbreviation of words and terms can be observed every day: *OPA* for *Office of Price Administration; cop* for *copper; Sam* for *Samuel; auto* for *automobile; photo* for *photograph*. Old words are made to do duty for new concepts, as: *tire, wave, ray, streamline, trolley*. Against this inertia—which in English tends toward a shrinking vocabulary, a monosyllabic speech, and the disappearance of inflectional endings (*thou sayest* and *ye say* are *you say* today for both forms)—stands the necessity for keeping up with an expanding civilization and for preserving synonyms for the sake of clarity and literary beauty. Thus we invent numerous new words (*proton, neutron, radio, radar, electronics*); and retain old words—which would otherwise disappear—for the sake of clarity (*felony, misdemeanor, larceny*), or for their agreeable connotations or dignified associations (*bulwark of liberty*, Masefield's *periwigged charioteer*, etc.). Sometimes older linguistic forms are consciously revived for reasons of national pride, as in modern Spanish, Gaelic, Greek, and Hebrew.

The ultimate origin of language is still unknown. Even if we assume that the earliest words were purely onomatopoetic—*i.e.*, imitative of natural sounds, such as *hiss, buzz, cuckoo*—we cannot understand how the system of conventional symbols known as language developed

EVERY MAN IN HIS OWN TONGUE

These translations of St. John 3:16 indicate the variety of language forms and of forms of writing or printing in which the Scriptures have appeared

Courtesy American Bible Society, N. Y.

ENGLISH

For God so loved the world, that he gave his only begotten Son, that whosoever believeth in him should not perish, but have everlasting life.

RUSSIAN

Ибо такъ возлюбилъ Богъ міръ, что отдалъ Сына своего единороднаго, дабы всякій, вѣрующій въ Него, не погибъ, но имѣлъ жизнь вѣчную.

SPANISH

Porque de tal manera amó Dios al mundo, que haya dado á su Hijo unigénito; para que todo aquel que en él creyere, no se pierda, mas tenga vida eterna.

MAYA (*Yucatan.*)

Tumeu bay tu yacuntah Dioz le yokolcab, ca tu caah u pel mehenan Mehen, utial tulacal le max eu yoczictuyol ti leti, ma u kaztal, uama ca yanacti cuxtal minanuxul.

JAPANESE

しめんが爲なり
信ずる者は亡るること無して永生を受
ゆゑ世の人を愛し給へり此は凡て彼を
十六 汝神はその生たまへる獨子を賜ふ

CANTON (Colloq)

因爲上帝愛世界甚至
械但獨生之子賜過但
地、令但凡信但嘅免至
滅亡、又得永生。

from these words. The same is true for interjections, cries, and shouts, such as *oh* and *ouch* —aside from the fact that interjections and onomatopoetical words or root-words form much too small a part of any language to be considered seriously. The fact is, we do not know how language as such originated, though we can reconstruct or observe the genesis and development of separate languages. As each living language is subject to a continuous addition of new symbols, and a permutation of those already existing, these symbols themselves change their meanings. It is in the study of historical semantics, or the change of meaning in language, that the shifts of reference in applying symbols may be observed. Here too there are some general tendencies manifest. One is the tendency to have reference broadened from the concrete to the abstract. For example, a word denoting a perceptive process such as smell, which has a meaning more or less abstract, derives in many instances from an object that could be smelled. It is only in comparatively recent times that certain words have been reserved for subjective use, and even now the shift of meaning is by no means a complete one.

At present about 2,800 different languages and major dialects are spoken. Some part of the Bible has been either translated or published at various times in 1,068 different languages or dialects. The number of people speaking any particular language is difficult to determine because dialects or variations of a language are greatly mixed and constantly changing. The following table, however, gives a rough estimate of the number of people speaking the chief languages of the world:

Chinese	420,000,000
English	240,000,000
Hindu	120,000,000
German	113,000,000
French	100,000,000
Russian	100,000,000
Spanish	80,000,000
Japanese	70,000,000
Portuguese	50,000,000

All charts, maps, and schemes of languages which attempt to clarify and systematize languages, dead or living, are incomplete and misleading because the relationships of languages to each other and to common root-languages are as yet not clearly established. The list which is given below is based upon the works of Mario A. Pei and Bodmer.

MAJOR LANGUAGES OF THE WORLD

(*a*) *Indo-European Languages*

(1) Albanian

(2) Armenian

(3) Baltic (Lettic): Latvian (Lettish) Lithuanian

(4) Celtic: Breton, Irish (Erse), Scotch Gaelic, Manx, Welsh, Cornish, Gaulish

(5) Germanic (Teutonic): Afrikaans, Danish, Dutch, English, Flemish, Frisian, High and Low German, Icelandic, Norwegian, Swedish, Yiddish
Anglo-Saxon,* Gothic,* Middle and Old High German*

(6) Greek: Modern Greek
Ancient Greek*

(7) Hittite* (sometimes regarded as a cognate of parent Indo-European, not a subdivision of that family)

(8) Indo-Aryan: Assamese, Bengali, Bihari, Guajarati, Hindu, Marathi, Oriya, Panjabi, Rajasthani, Singalese, Urdu, *et al.*
Prakrit,* Sanskrit,* Vedic*

(9) Iranian: Balochi, Kurd, Persian, Pushtu (Afghan)
Avesta,* Pahlevi*

(10) Romance: Catalan, French, Italian, Ladino, Portuguese, Provencal, Rhaeto-Romanic, Rumanian, Spanish
Latin,* Caco-Umbrian,* Sabellian*

(11) Slavonic: Bulgarian, Czech, Polish, Russian, Ruthenian, Serbo-Croatian, Slovak, Slovene, Wendish, White Russian

(12) Tocharian*: Old Church Slavonic,* Polabian*

(*b*) *Basque*

(*c*) *Etruscan**

(*d*) *Caucasian:* Avar, Circassian, Georgian, Laz, Lesghian, Mingrelian, *et al.*

(*e*) *Ural-Altaic:*

(1) Altaic: Kirghiz, Mongol, Tartar, Tungu (Manchu), Turkish, Uzbeg, *et al.*

(2) Finno-Ugrian: Cheremiss, Estonian, Finnish, Hungarian (Magyar), Karelian, Lappish, Mordvinian, Ostyak, Nenets, Votyak

(*f*) *Hamitic and Semitic:*

(1) Hamitic: Berber, Cushite, Libyan
Egyptian,* Coptic

(2) Semitic: Amharic, Arabic, Maltese, Syrian
Aramaic,* Hebrew*
Assyrian,* Babylonian,* Phoenician*

(*g*) *African Negro Languages:*

(1) Bantu: Bechuana, Congo, Duala, Herero, Kafir, Luganda, Sesuto, Swahili, Umbundu, *et al.*

(2) Hottentot-Bushman

(3) Sudanese: Hausa, Mandingo, Masai, Nubian, Yoruba, *et al.*

* Dead languages, *i.e.*, such languages as are mainly known as written languages only and are no longer spoken in daily conversation.

(*h*) *Sino-Tibetan:* Burmese, Chinese, Siamese (Thai), Tibetan
(*i*) *Dravidian:* Bhil, Brajui, Canarese, Gond, Malayalan, Tamil, Telugu
(*j*) *Annamese*
(*k*) *Mon-Khmer*
(*l*) *Munda*
(*m*) *Malaya-Polynesian:* Fijian, Javanese, Maori, Malay, Tahitian, *et al.*
(*n*) *Ainu*
(*o*) *Japanese and Korean*
(*p*) *Australian and Papuan*
(*q*) *American Indian Languages:*
(1) North American: Algonquian, Eskimo, Iroquois, Uto-Aztec
(2) Central American: Mayan, Mixtec, Zapotec, *et al.*
(3) South American: Arawak. Araucanian, Cariban, Quechua, Tupi-Guarani, Chibchan, *et al.*

Langur (*lŭn'gōōr*), or LANUMAN, one of the two best-known monkeys of the Old World. Its habitat is the Himalaya Mts. in India. The other most common monkey is the green monkey of Africa.

Lanier (*lă-nēr'*), SIDNEY, poet, born in Macon, Ga., Feb. 3, 1842; died in Lynn, N.C., Sept. 7, 1881. At 18, he was graduated from Oglethorpe Coll.; at 19 he entered the Confederate Army. While a prisoner-of-war at Point Lookout, Md., he contracted a life-long case of tuberculosis. He also wrote there his only novel, "Tiger-Lilies" (1867). During the Reconstruction, the South offered Lanier only hack-writing or third-rate legal jobs, and in 1873 he became a flutist with Baltimore's Peabody Orchestra. After the publication of several scholarly works, he lectured on English literature at Johns Hopkins Univ. (1879-81). His first major published poem, "Corn" (1874), was followed in 1877 and 1884 with collections of his poetry, including, notably, "The Song of the Chattahoochee," "Evening Song," "A Ballad of Trees and the Master," "The Symphony," and "The Marches of Glynn." Lanier felt that, as in music, time—not accent—governed poetry, and his work remains noted for achieving in verse the cadences of music.

Lankester (*lăn kĕs-tĕr*), EDWIN RAY, scientist, born in London, England, May 15, 1847; died Aug. 15, 1930. He studied at Christ Church, Oxford, and in 1874 became professor of zoology and comparative anatomy in Univ. Coll., London. His writings include "Comparative Longevity," "Developmental History of the Mollusca," "Degeneration," and "The Advancement of Science."

Lanner (*lăn'ĕr*), JOSEF, composer, born in Austria in 1801; died in 1843. Next to Johann Strauss, Jr., Lanner's name is closely associated with the gay and melodic waltzes for which Vienna is famous. He was a popular director of court and masquerade balls in Vienna. In addition to waltzes, he wrote polkas, cotillions, quadrilles, galops, and marches. See also *Music.*

Lannes (*lăn*), JEAN, Duke of Montebello and marshal of France, born at Lectoure, France, Apr. 11, 1769; died in Vienna, Austria, May 31, 1809. He was the son of a liveryman and studied the art of dyeing. In 1792 he enlisted for service in the army sent on a campaign into Spain and Italy, and by 1796 attained the rank of brigadier general. He accompanied Napoleon to Egypt in 1789, and later fought in Italy and Germany. In 1809, at the Battle of Aspern, he lost both legs, which caused his death.

Lanolin (*lăn'ō-lĭn*), or LANALIN, a fat obtained from the wool of sheep, from which it is extracted by gasoline or a solvent and by washing. Wool fat is dark and disagreeable in odor until it is purified into a bland, white fat, which has the property of absorbing large amounts of water. It is used in soap making, in cosmetics, as an ointment base, and in leather-dressing.

Lansdowne (*lănz'doun*), HENRY CHARLES, statesman, born Jan. 16, 1845; died June 4, 1927. He studied at Oxford and succeeded to the family titles in 1866, from which time he was an active member of the House of Lords. In 1883 he became governor general of Canada, in 1895 was made viceroy of India, and later served as secretary of foreign affairs. He entered the coalition ministry in 1915, but resigned at the ascendancy of David Lloyd George.

Lansdowne, SIR WILLIAM PETTY FITZMAURICE SHELBURNE, FIRST MARQUIS OF, born in Dublin, Ireland, May 20, 1737; died in London, England, May 7, 1805. Early active in English politics, he became president of the board of trade (1763). Sympathizing with the American colonists, he opposed the Stamp Act (1764) and, as secretary of state (1766-68) under William Pitt (*q.v.*), he tried in vain to avert the American Revolution. As home secretary (1782) and prime minister (1782-83), he recognized U.S. independence and concluded peace treaties with France and Spain. His ministry ended with his resignation in 1783.

Lansing (*lăn'sĭng*), a city in Michigan, capital of the state, at the junction of the Grand and Red Cedar rivers. 88 m. N.W. of Detroit. It is served by the New York Central, the Chesapeake & Ohio, and the Grand Trunk R.R.'s. Capital City Airport is 7 m. W. of the city. Lansing covers an area of 20.6 sq. m., including 36 parks comprising 1,600 acres. It is the seat of Michigan State Univ. and the Michigan School for the Blind. The city's notable buildings include the capitol, the Civic Center, completed in 1959, and the new city hall and police building.

Primarily an industrial center, Lansing has

LANSING, MICHIGAN. STATE CAPITOL BUILDING

manufactures of automobiles and trucks; tools, dies, and forgings for the automobile, airplane, and railroad industries; agricultural implements, heating units, plastics, and stationery. It is the center of the Lansing Standard Metropolitan Statistical Area (1960 pop., 298,949), which includes Clinton, Eaton, and Ingham counties. The city in 1958 had a value added by manufacture of $248,157,000. Lansing was settled in 1837 and named by a pioneer from Lansing, N.Y. It became the capital in 1847 and was incorporated as a city in 1859. Population, 1900, 16,485; in 1910, 31,229; in 1930, 78,397; and in 1960, 107,807.

Lansing, ROBERT, lawyer and statesman, born in Watertown, N.Y., Oct. 17, 1864; died in Washington, D.C., Oct. 30, 1928. He studied at Amherst Coll., was admitted to the bar, and practiced law, representing the U.S. in the Bering Sea arbitration and other cases. In 1914 he became counselor for the State Dept., and when William Jennings Bryan (*q.v.*) resigned in 1915, he was made Secretary of State. He was one of the American commissioners at the Versailles peace conference in 1919. He resigned as Secretary of State in 1920.

Lansing Man, a skeleton believed to be an example of prehistoric man, resembling primitive Indians. The skeleton was discovered near Lansing, Kans., in 1902, and is now in the National Museum at Washington, D.C.

Lantern Fly (*lăn'tērn flī*), an insect allied to the cicadas. The genus includes several thousand species, some of which are widely distributed in the tropical regions of both hemispheres. Many are large and highly colored. Some are remarkable because of the forehead being formed in the semblance of a bag. Most of the species are about 3 in. long and 5 in. across the wings. They move about most commonly during sunshine and feed on herbs and grasses.

Laocoön (*lā-ŏk'ō-ŏn*), in Greek legend, a priest of Apollo and Poseidon, located in the city of Troy during the Trojan War. According to the legend, while he and his two sons were in the temple performing a sacrifice, two enormous serpents arose out of the sea and proceeded directly to the altar. The serpents entwined themselves about the helpless youths and the father, and all were destroyed in the presence of a Trojan multitude. This event was taken by the Trojans to indicate the anger of Zeus because Laocoön had warned against admitting the Greek wooden horse to the city. The incident is mentioned frequently in Greek poetry and has inspired many sculptors. A notable sculpture of Laocoön and his sons was discovered in Rome in 1506 and purchased by Pope Julius II. Napoleon seized it in 1796, but in 1814 it was restored to the Vatican.

LAOCOÖN
A Greek sculpture of the 2nd century B.C.

Laodamia (*lā-ō-dą-mī'ą*), in Greek mythology, the wife of Protesilaus (*q.v.*). She is the central figure of a poem by William Wordsworth.

Laodicea (*lā-ŏd-ĭ-sē'ą*), the name of several ancient cities of Asia Minor, the most important of which was situated near the Lycus River in Phrygia. It was founded by Antiochus Theos and

named after his queen, Laodice. It became a center of philosophy, art, and science and was the site of two ecclesiastical councils (A.D. 363 and 476). Its importance in the early history of Christianity was due to the large number of Jews who had settled there about the beginning of the Christian era. Its ruins are near the present site of Denizli, Turkey.

Laos (*lä'ōs*), a constitutional monarchy in southeastern Asia. It is bounded on the N. by China, on the E. by Viet Nam, on the S. by Cambodia, and on the W. by Thailand and Burma. The area is *ca.* 90,000 sq. m. The climate of Laos is tropical. The principal crops are rice, corn, tobacco, citrus fruits, tea, and coffee. Tin is the most important mineral. The northern part of the country, which is crossed by many streams, has valuable teak forests and much wild game. The inhabitants, most of whom are Buddhists, stem from three racial stocks, Thai, Indonesian, and Chinese. The royal capital is Luang Prabang, and the administrative center is Vietiane.

A kingdom, Lan Xang, in the 14th century, which split in the early 18th century, Laos became a French protectorate in 1893. A provisional agreement in August 1949 established Laos as an independent state within the French Union, and in 1950 France granted Laos internal autonomy. The country is governed by a king, with a prime minister and a council. The national assembly is elected every four years by universal suffrage. In accordance with the Geneva Conference, in 1954, all French Union troops were withdrawn by agreement, to match the withdrawal of Communist Viet Minh (anti-French) troops, but Laos lost two northern provinces to the Communists. Population, *ca.* 2,000,000.

Lao-tse (*lou'dzŭ*) or LAO-TZU, or LAO-TZE, philosopher, born in Kiuh-jin, China, *ca.* 604 B.C.; died *ca.* 531 B.C. The book attributed to him, the "Tao Teh King" (The Teaching of Tao), propounded a doctrine called *Tao* (The Way), later formulated into a religion called Taoism (*q.v.*). Its central point was that the universe operates in its own way and that the more closely individual man aligned himself with this way—*i.e.*, by non-action or near-passivity—the happier he would be. In contrast to the teachings of Confucius (*q.v.*), who emphasized authority and piety, Lao-tse stressed ethical perfection of the individual. He was formerly thought to have been a teacher of Confucius, because many of his ideas were gradually absorbed into Confucianism.

La Paz (*lä päs*), a city of Bolivia, capital of a department of the same name, some 40 m. S.E. of Lake Titicaca. It lies in the valley of the La Paz River, *ca.* 12,000 ft. above sea level. Although Sucre (*q.v.*) is the nominal capital of Bolivia, La Paz is the administrative capital. The city, founded by Spaniards in 1548, is connected by rail and air lines with adjacent countries. La Paz has a school system, several educational institutions, including a university, and a cathedral. There is a large trade in alpaca wool, tin, quinine bark, lumber, gold, and silver. Manufactures include textiles, shoes, glass, paper, and tile. Most of the inhabitants are Spanish or Spanish-Indians and Aymara Indians. Population, 1950, 321,063.

La Pérouse Strait (*lä pā-rōōz' strāt*), a passage *ca.* 25 m. wide between the islands of Sakhalin and Hokkaido, joining the Sea of Japan with the Sea of Okhotsk. It was discovered by Jean François de Galaup, Count of La Pérouse (born Aug. 22, 1741; died by shipwreck in 1788), on an expedition to find the Northwest Passage.

Lapidary Art (*lăp'i-dâ-rỹ ärt*), the art of cutting and polishing stones, especially precious stones. The earliest known examples of carved stones are the cylindrical seals of Babylonia and Assyria (4800 B.C.) and the scaraboid ring seals of Egypt. The Hindus and the Chinese also seem to have known the art at an early period. The most beautiful seals were made in the period from 500 B.C. to A.D. 400, particularly in Greece and Egypt. Seals were first carved with simple animal forms; later, wide varieties of symbolic figures, talismanic forms, and inscriptions were added. Many artists continued to work with the sapphire point and the hand bow-drill, although the

LAO-TSE
From a Chinese drawing

wheel lathe was developed at a relatively early period.

The decline of the lapidary art lasted until the beginning of the Renaissance in Europe, when gem cutting was developed. Before that time, stones were prepared in the "cabochon" style; that is to say, the natural rounded surface was preserved and polished to bring out color and translucency. The method of shaping the surfaces of a stone in faceted planes is strictly a development of modern times. Today, it is employed almost invariably with transparent stones, such as diamonds, rubies, sapphires, emeralds, and topaz, because of the brilliancy resulting from refraction of light from the faceted surfaces. About 1280, Paris, Nuremberg, and Bruges were busy centers of the lapidary art, but skill in diamond cutting did not develop until 1475, when Charles the Bold of Burgundy ordered the first large diamond prepared in Europe. Five years later, Amsterdam was the most important center for diamonds and Lisbon for colored stones. Since 1875, the lapidary art has been carried on in London and Birmingham, as well as the flourishing centers of Amsterdam, Paris, and Antwerp.

The process leading to a finished stone may be divided into three stages. The stone is first subjected to cleaving and grinding to remove defective parts and improve the shape. Next, the surface is cut into rectangular and triangular planes, or facets. Last of all, the stone is given a high polish. The polishing material and tools depend on the stone to be treated. In general, modern gem cutting is done by means of a revolving lathe set with a point of soft iron which is constantly lubricated with a mixture of diamond dust and oil. Another machine used is the S.S. White dental engine, which produces results similar to hand work. The usual designs are the "brilliant," the "rose," the "table cut," the "briolette," the "marquise," and the "star cut." See also *Diamond*.

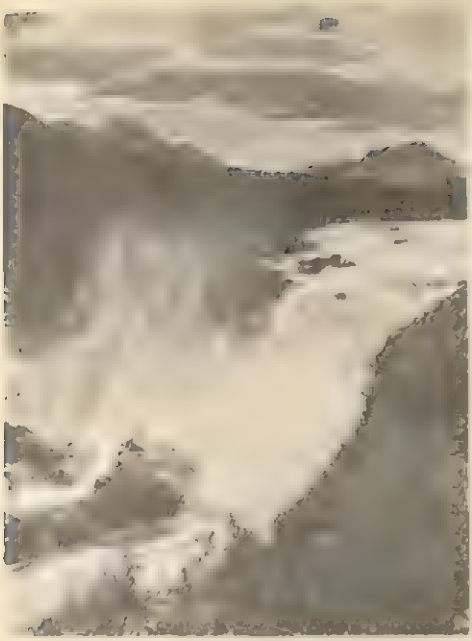
Lapis Lazuli (*lă'pĭs lăz'ū-lī*), or ARMENIAN STONE, a rich blue mixture of minerals, of which the principal component is lazurite. It was widely employed by the ancients for decorative purposes. It occurs principally in crystalline limestone in North and South America, Tibet, Russia, China, and many other countries. When powdered, it constitutes a durable blue paint called *ultramarine*, which was employed formerly to some extent, but it has been replaced by an artificial preparation of similar composition that is equal in color and durability, and is now used extensively in the arts. Imitations of lapis lazuli are made of bone ashes colored with oxide of cobalt.

Laplace (*là-plăs'*), PIERRE SIMON, MARQUIS DE, mathematician and astronomer, born in Beaumont-on-Auge, France, Mar. 23, 1749; died in Paris, Mar. 5, 1827. He was educated in his native

PIERRE S. DE LAPLACE

town and Caen, taught mathematics in the military school at Beaumont, and later went to Paris. While there, at the age of 18, he approached D'Alembert with letters of recommendation, and, after impressing him with his treatise on dynamics, he secured a professorship in the Royal Military Acad. His notable contributions to mathematics and astronomy won him associate membership in the Acad. of Sciences at the age of 24. In 1785 he became a member. He aided in establishing normal schools for teachers, thus laying the foundation for systematic education. Napoleon honored him by appointing him minister of the interior; he held this post only six weeks, but was raised to the dignity of a count. After the second restoration Louis XVIII made him a marquis. His investigations cover a great variety of subjects from pure mathematics to physics and astronomy. He worked out in great detail all the consequences of Newton's law of gravitation in planetary motions and embodied his results in his classical "Système du Monde" (1796). He originated the "nebular hypothesis," which assumed that the solar system was a hot gaseous body, which in cooling and shrinking formed the universe with the sun at the center. It is related that his last words were: "What we know is of small amount; what we do not know is enormous."

Lapland (*lăp'land*), a large section of Northwestern Europe, home of the Lapps, comprising an area of about 95,000 sq. m. It is bounded on the west by the Atlantic, on the north and east by the Arctic Ocean, and on the south by the White Sea and by about the parallel of 66° N. lat. The region belongs partly to Russia, Finland, Sweden, and Norway. In the western part it is mountainous, but in the eastern part is a plain with numerous rivers and lakes. The two seasons are designated as day and night, the night season comprising nine months, being extremely



Courtesy Swedish Travel Information Bureau, N. Y.

WATERFALL SCENE IN LAPLAND

cold, while the day season, three months of continuous day, has about six weeks of warm and pleasant weather. Vegetation consists largely of mosses and small timber, including birch, fir, and pine. Few domestic animals are reared, aside from reindeer and dogs. Hunting and fishing are the principal occupations, though there are some developments in the culture of reindeer, vegetables, fodder, and rude manufacture. The lakes and coastal waters are rich in fish, particularly the White Sea and Lakes Kuto, Kano, Enara, and Imandra.

LAPLAND WOMAN

Courtesy Swedish Travel Information Bureau, N. Y.

The Lapps are classed as Turanians, belonging to the Finnic branch. They are small in stature, have a flat nose, high cheek bones, and a scanty beard. Most of these people are muscular and have red hair. Many are nomadic in the summer season, when they hunt and fish, laying in a portion of the necessary supply for winter. Nearly all the Scandinavian Lapps are Lutheran, while those of Russia are affiliated with the Greek Church. So far as is known they were subject to the Norsemen up to the 12th century, since which time they have been conquered by and alternately subject to Norway, Russia, and Sweden. The nomadic tribes speak a variety of dialects. The total number of Lapps is about 30,000, of which about half are in Finland.

La Plata (*lä plä'tä*), renamed (1952) EVA PERÓN, a city in Argentina, capital of Buenos Aires province, 35 m. S.E. of the city of Buenos Aires, and 5 m. inland from Ensenada, its port on the Río de la Plata. A well-planned city with wide streets and handsome buildings, it is laid out like Washington, D.C., and is the site of a university. The city was founded in 1882 as the provincial capital and owes its growth to the development of varied industries, principally textiles, brewing, glass, steel, and oil refineries. It is also known as a meat-packing center and a shipping point, although its port facilities are outdone by the competition of nearby Buenos Aires. Population, 1947, 115,113.

La Plata, RÍO DE. See *Plata, Río de la.*

La Porte (*lä-pôrt'*), county seat of La Porte County, Indiana, 12 m. from Lake Michigan and 58 m. from Chicago, Ill. It is on the Pere Marquette, the N.Y. Central, and the Nickel Plate R.R.'s. Among the manufactures are farm implements, water heaters, woolen goods, clothing, and machinery. The place was settled in 1830 and incorporated in 1832. Population, 1900, 7,113; in 1940, 16,180; in 1950, 17,882.

Lapwing (*läp'wing*), a genus of birds of the plover family, native to the temperate parts of Asia and Europe. In autumn they move southward to spend the winter. They are about the size of a pigeon, frequent marshes and woodlands, and from their peculiar cry are frequently called *peewit.* Both the birds and their eggs are hunted for food, the eggs being laid largely in cultivated fields, marshes, and depressions on the plains. The length of the common lapwing is about 12 in. The color is variegated, but usually

brownish-red, and the male has a crest of feathers on the head, which is most prominent in the winter time. They were named lapwing from their habit of luring intruders away from their nest by appearing to be lame.

Laramie (*lăr'ą-mī*), a river of southeastern Wyoming. It rises in northern Colorado, flows northward across the Wyoming border and thence northeast, emptying into the North Platte River. Its length is *ca.* 200 m.

Laramie, a city in southeastern Wyoming, seat of Albany County, on the Laramie River, 56 m. N.W. of Cheyenne. It is served by the Union Pacific R.R. Laramie is the seat of the Protestant Episcopal St. Matthew's Cathedral, and of the Univ. of Wyoming, adjacent to the campus of which is the Laramie Petroleum Research Center of the U.S. Bureau of Mines. The city is surrounded by Medicine Bow National Forest, and wildlife preserves are nearby. The chief industries are railroad shops and the manufacture of cement and lumber products. The surrounding country produces cattle and sheep. It was settled in 1868 and incorporated in 1873. Its early cowboy days have made Laramie a part of the folklore of the West. Population, 1960, 17,520.

Laramie Mountains, a mountain range of the U.S., extending from southeastern Wyoming into northern Colorado. The highest point is Laramie Peak (9,020 ft.). Coal is the principal mineral deposit.

Larceny (*lär'sē-nĭ*), the taking and removing of personal property belonging to another, with the intent of depriving the owner of what belongs to him. The crime of larceny is usually divided into two kinds, known as *petty* and *grand*, though the distinction is abolished in some jurisdictions. Where these terms are recognized, they are used to designate crimes punishable by different penalties. Petty larceny is the designation when the value of the property stolen is small and the criminal may be tried and punished in a lower court. A charge of grand larceny is subject to investigation by the grand jury.

Larch (*lärch*), a genus (*Larix*) of deciduous trees of the pine family, bearing leaves in clusters and having cones. Larches grow to an average height of 60 ft., having short, horizontal branches forming a narrow head, and red-brown bark. The light bluish-green leaves are 1 in. to 1½ in. long. The American species, also called tamarack, hackmatack, and black larch, are native to the northern U.S., Canada, and Alaska. The Western larch, found in Washington, Montana, Idaho, and adjacent Canada, is the tallest species, growing to heights of 140 ft. to 180 ft. Species of larch are also found in Europe and in Asia.

Lard (*lärd*), a soft, white fat, solid or semisolid, obtained by rendering the fatty tissue of the hog. Leaf lard, the highest quality, is made from leaf fat, which lines the abdominal cavity of the hog and surrounds the kidneys. Lard is composed of stearin, the solid portion; olein, the liquid portion; and palmatin, a solid crystalline substance. Lard was formerly widely used in cooking and is still so used to some extent. It is also used in the manufacture of some margarines and as a base for ointments.

Lardner (*lärd'nĕr*), RING (RINGGOLD), writer and humorist, born in Niles, Mich., March 6, 1886; died in East Hampton, N.Y., Sept. 25, 1933. Lardner began his literary career as reporter on the South Bend (Ind.) *Times* (1905-07) and sports writer for other newspapers, notably the Chicago *Tribune* (1913-19). The success of his first books enabled him to devote himself to this field, and his humorous works include "Bib Ballads" (1915), "You Know Me, Al" (1916), "Treat 'Em Rough" (1918), "The Big Town" (1921), "What Of It?" (1925), and the plays "Elmer the Great" (with George M. Cohan, 1928) and "June Moon" (with George S. Kaufman, 1929). Lardner's work is marked by subtly simple humor, sharp satire, and perceptive character delineation.

His son, JOHN LARDNER, writer, was born in Chicago, Ill., May 14, 1912; died in New York, N.Y., March 24, 1960. After studying (1929-30) at Harvard Univ., he became a reporter (1931-33) for the New York *Herald Tribune*. Thereafter he was a sports columnist for the North American Newspaper Alliance (1933-38), *Newsweek* magazine (1939-57), and the *New Yorker* (1957-60). He served as a correspondent in World War II (1942-45), contributing articles to the three last-named publishers.

Laredo (*lą-rā'dō*), a city and port of entry in southern Texas, seat of Webb County, on the Rio Grande, 153 m. S.W. of San Antonio. It is served

RING LARDNER

Wide World Photo

by the Missouri Pacific and other railroads; Laredo Municipal Airport is 5 m. N. of the city. The city is the site of Laredo Junior Coll. and Laredo Air Force Base. A major link between the U.S. and Mexico, with which it is connected by the Friendship Bridge across the Rio Grande, Laredo has industries which include smelting and the manufacture of machinery, bedding, apparel, cement products, and furniture. It is the center of the Laredo standard metropolitan statistical area (3,293 sq. m.; pop., 1960, 64,791), including all of Webb County, which in 1958 had a value added by manufacture of $3,979,000. The surrounding area produces oil and natural gas, as well as cattle, grapes, melons, and truck crops. Because of its mild climate, Laredo is a popular winter resort, drawing many visitors with its colorful celebrations of both American and Mexican holidays. Settled by the Spanish in 1755, it is the oldest independent town established in the area of Texas. In 1840 it was the capital of the Republic of the Rio Grande. It was incorporated and made county seat in 1848. Population, 1950, 51,910; in 1960, 60,678.

Lares and Penates (*lā'rēz, pē-nā'tēz*), in Roman mythology, household gods worshiped daily to avert the evils resulting from their anger. The Lares were kept on the hearth or in a special niche with the Penates. They were offered food at every meal and were honored on all festive occasions and on special days devoted to them. The Lares were considered the spirits of the family's ancestors, the chief of them representing its founder. According to varying theories, they originated as farmland deities or as spirits of the dead. The Penates originated as protectors of the storeroom and gradually came to be considered general household guardians with the Lares.

There were also public Lares and Penates, considered guardians of the unity of the state and honored with temples and with annual festivals in their honor.

Lark (*lärk*), a family of songbirds native chiefly to Europe, Asia, and northern Africa. Some 75 species have been classified, best known of which are the skylark of Europe and the horned lark of North America. The larks frequent fields, deserts, and prairies and tend to show protective coloration. Their song occurs only in flight. On the ground they run rather than hop. The lark lays four or five mottled grayish eggs, in a nest of grass on the ground. The horned lark, found in the U.S., is brownish-gray with a black collar and a yellow stripe over the eyes. The "horns" are two tufts of feathers on the forehead.

Larkspur (*lärk'spûr*), any of a group of annual or perennial herbs of the genus *Delphinium* of which more than 250 species are found in the North Temperate Zone. The larkspur has lobed or divided leaves. The flowers, growing in spikes, occur mostly in shades of blue. The scarlet larkspur (*Delphinium cardinale*) is a species found in southern California.

La Rochefoucauld (*là rôsh-fōō-kō'*), FRANÇOIS, DUKE OF, courtier and maxim writer, born in Paris, France, Sept. 15, 1613; died there Mar. 17, 1680. His father was a duke under Louis

FRANÇOIS DE LA ROCHEFOUCAULD

XIII, and François became known as Prince de Marsillac in his early youth. At 17 he entered the army, took part at the siege of Casale, and was exiled by Richelieu to Blois for supporting the party of Queen Anne of Austria. He remained an exile from 1639 until 1643, supported several military exploits, and after 1653 engaged largely in literary work in his native country. In 1662 he published his "Memoirs" and later his "Réflexions, ou sentences et maximes morales."

La Rochelle (*lä rô-shĕl'*), a port city in France, capital of the department of Charente-Maritime, located on the Bay of Biscay and the Rochelle River, 124 m. S.W. of Tours. It is a fishing port, and its industries include metalworking, shipbuilding, and the manufacture of textiles. During the Wars of Religion it was a Huguenot stronghold; and because of its picturesque buildings and historical associations it is a tourist center. Population, 1954, 58,799.

Larousse (*lä-rōōs'*), PIERRE ATHANASE, grammarian, lexicographer, and encyclopedist, born at Toucy, France, in 1817; died in 1875. Larousse compiled a number of handbooks which not only revolutionized the French system of education but also proved invaluable to scholars of France and many other countries. The most important of his books are: "Dictionnaire de la Langue Française" (1856), "Grammaire Supérieure" (1868), and the educational journal,

L'École Normale (1859). He was co-founder of the publishing house of Larousse, which was dedicated to the purpose of bringing out his great work, "Grand Dictionnaire Universel de XIXe Siècle." He spent the last 10 years of his life in doing the groundwork for the "Dictionnaire," which later formed the basis of the "Nouveau Larousse Illustré" (eight volumes, 1922) and "Larousse Universel" (two volumes, 1922), both familiar to every student of the French language.

Larva (*lär'vä*), a term applied to the first stage in the development of insects, in which the young, after issuing from the egg, undergo a change of form known as *metamorphosis*. At this stage they are very different from the adults. The larval stage is so called because the form of the young masks or conceals that of the adult. It differs from the early stage in animals whose young are similar in form to the parent, the term *foetal stage*, or *fetal state*, being applied in the latter case. The greater part of growth in insects is developed during the larval state, and the skin is shed from time to time as may be required by the enlargement of the growing body. The *tadpole* is the larva of the frog; the *maggot*, of the fly; the *zoëa*, of the crab; and the *caterpillar*, of the moth or butterfly. See *Beetle*.

Laryngitis (*lăr-ĭn-jī'tĭs*), in medicine, inflammation of the larynx (*q.v.*), the upper continuation of the windpipe. It is usually accompanied by soreness of the throat and is generally caused by the common cold. There may be fever and temporary loss of voice.

Laryngology (*lăr-ĭn-ğŏl'ô-ğy*), in medicine, the science of the larynx and treatment of disturbances of the larynx (*q.v.*).

Laryngoscope (*lä-rÿn'ğō-skōp*), an instrument which permits interior examination of the larynx. Consisting of a tiny mirror attached to the end of a long handle, the laryngoscope was invented by the singer, Manuel García (*q.v.*).

Larynx (*lăr'ĭnks*), the special organ of voice, situated at the upper part of the windpipe, or trachea, and at the base of the tongue, immediately below the hyoid bone. The larynx forms a projection of cartilage, known as *Adam's apple*. It consists of a cartilaginous box, across which are stretched folds of mucous membranes. These membranes constitute the vocal cords, which, by their vibration, due to passing of air from the lungs, produce sound. The glottis is a cleft or opening between the vocal cords at the upper orifice of the larynx, while the epiglottis is a leaflike lid upon the back of the tongue, which closes the larynx when swallowing. See *Voice*.

La Salle (*lä säl'*), a city of La Salle County, Illinois, on the Illinois River, 98 m. s.w. of Chicago. It is on the Illinois & Michigan Canal and on the Illinois Central, the Chicago, Burlington & Quincy, and the Chicago, Rock Island & Pacific R.R.'s. The surrounding country is agricultural and dairying and contains deposits of bituminous coal and building stone. Among the manufactures are watches and clocks, cement, bottled goods, ironware, and machinery. It has a large trade in produce and merchandise. La Salle was settled in 1830, when it was named after La Salle, the explorer. Population, 1950, 12,083.

La Salle (*lä säl'*), RENÉ ROBERT CAVELIER, SIEUR DE, explorer, born in Rouen, France, Nov. 22, 1643; assassinated Mar. 19, 1687. In 1669 he emigrated to Canada, having previously been ordained as a priest, and soon after entered upon a number of remarkable expeditions of discovery. He visited the Illinois River, Lake Michigan, and the Ohio, and sailed a considerable distance down the Mississippi. In 1673 he received a grant of Ft. Frontenac, now Kingston, Ontario, and in 1677 returned to France. The following year he made a second voyage to America, ascended to Mackinaw, thence crossed Lake Michigan, and proceeded down the Illinois River to Peoria. On Apr. 9, 1682, he planted the French flag on the Gulf of Mexico and claimed the entire Mississippi River basin for Louis XIV. In 1684 he organized an expedition, which sailed directly from France for the mouth of the Mississippi, where he was commissioned to establish a settlement. He failed, however, to find the chief mouth of the Mississippi, but landed at Matagorda Bay, and after many fruitless efforts was murdered by his followers within the present confines of Texas. Many conflicting statements have been published regarding the life and achievements of La Salle. A very interesting account is given in Parkman's "Discovery of the Great West."

SIEUR DE LA SALLE

Las Casas (*läs-kä'säs*), BARTOLOMÉ DE, Domini-

can missionary and protector of the Indians, born in Seville, Spain, in 1474; died in Madrid, July 1566. Following his graduation from the Univ. of Salamanca, he accompanied Columbus on the second of his voyages to America and, in 1502, went to Haiti with the newly appointed governor, Nicolás de Ovando. After becoming a priest (1510), he proceeded to Cuba to pacify and convert the natives. Considering war unjust and destructive to the best interests of the island, he consistently advocated peaceful procedure. He rapidly became interested in reforming abuses against the Indians and spent most of the rest of his life ameliorating their condition and pleading their cause at the Spanish court. At one time, he developed a plan to emancipate them completely and encourage Spanish colonization in the New World. He was later much ashamed of one provision which allowed each Spanish resident to import 12 Negro slaves, for he realized that the Africans were also entitled to liberty. In 1522, he withdrew to Haiti and after joining the Dominican order spent a number of years as a missionary in Mexico, Nicaragua, Venezuela, Peru, and Guatemala. He held a title as Adviser to the Council of the Indies, 1539-44, and accepted the bishopric of Chiapas, Mexico, in the latter year. Failing in his humanitarian endeavors because of stringent Spanish laws, he retired to a monastery in Valladolid, Spain, emerging occasionally to intercede further in behalf of the Indians. His writings include the famous *"Historia general de las Indias"* (first printed in 1875-76), *"Veynte Razones"* (1542), and *"Brevísima Relación de la Destruyción de las Indias occidentales"* (*ca.* 1554).

Las Cases (*läs kä'sēs*), EMMANUEL AUGUSTIN DIEUDONNÉ, COMTE DE, historian, born near Revel in Languedoc, France, 1776; died at Passy, May 15, 1842. Las Cases fought under Louis Joseph de Bourbon, Prince de Condé (1736-1818) in the royalist army during the French Revolution, and with the fall of the monarchy he emigrated to England (1792-99). Returning to France, he published an *"Atlas Historique"* (1803-04), and won the favor of Napoleon, whom he accompanied into exile on St. Helena. For a year he assisted Napoleon in the writing of his memoirs and was then expelled from the island, having been intercepted in an attempt to send a letter to Lucien Bonaparte. After the death of Napoleon, he was allowed to return to Paris, where he published his eight-volume *"Mémorial de Sainte Hélène"* (1821-23).

Las Cruces (*läs krōō'sēs*), a town in southern New Mexico, seat of Dona Ana County, near the Rio Grande, 42 m. NW. of El Paso, Texas. It is on the Atchison, Topeka and Santa Fe Ry. Las Cruces is the trade center of a large agricultural region. Near the town are the White Sands Missile Range and the Las Cruces Air Force Station. The town was founded in 1848. Population, 1950, 12,325; in 1960, 29,367.

Laser (*lā'zēr*). See *Maser*.

Lashio (*lą-shō'*), a city of Burma, *ca.* 130 m. N. of Mandalay, situated in the state of North Hsenwi, one of the Shan States. It is the terminus of the Rangoon-Lashio R.R. and the gateway to the Burma Road (*q.v.*). Lashio is the chief town and seat of government for the Northern Shan States.

The city gained prominence during World War II, when it was an important link in the supply route to China. Through their capture of Lashio, in May 1942, the Japanese were able to complete their land blockade of China. The Allies recaptured the city in 1945. Population, *ca.* 5,000.

Lasker (*läs'kēr*), EMANUEL, chess champion, born Dec. 24, 1868, in Berlinchen, Germany; died in New York City, Jan. 11, 1941. He began to play chess when he was 12, but he did not become world champion until 1894, when he defeated the Czech, Wilhelm Steinitz, who had held the championship every year since before Lasker's birth. Lasker remained champion until 1921, when he was defeated by the Cuban, José Capablanca. Lasker was the author of numerous books on chess, mathematics, and philosophy, and the editor of *Lasker's Chess Magazine* which he founded and published from 1902 until 1907. He left Germany (1933) to settle in the U.S.

Laski (*läs'kī*), HAROLD JOSEPH, political scientist, born in Manchester, England, June 30, 1893; died in London, March 24, 1950. A graduate of New Coll., Oxford, in 1914, Laski lectured in political science at McGill (1914-16), Harvard (1916-20), and Yale (1919-20) Univs. He returned to England (1920), to a professorship at the London School of Economics. His lectures

HAROLD LASKI

and Tuesday evening salons have become famous all over the intellectual world as a center of progressive thinking. Considered an outstanding authority on the theory and practice of governmental organization, he advocates Marxism, though he is opposed to the use of force to bring about reforms. Long considered a power in the British Labour party, he became chairman of its National Executive Committee (an advisory board) when the party was elected to power in 1945, holding this post until 1946. Among his books are: "The Problem of Sovereignty" (1917), "Political Thought from Locke to Bentham" (1920), "A Grammar of Politics" (1926), "Liberty in the Modern State" (1930), "Parliamentary Government in England" (1938), "The American Presidency" (1940), "Reflections on the Revolution of Our Time" (1943), and "Faith, Reason, and Civilization" (1944).

Las Palmas (*läs päl'mäs*), the largest city of the Canary Islands, on the northeastern shore of the island of Gran Canaria, in a fertile and productive valley. It has a fine harbor, which is fitted for the largest ships. The noteworthy buildings include the public library, the theater, the city hall, an academy of art, and several large churches. Among the manufactures are hats, wine, glass, clothing, and leather goods. It has a large trade in coal, fruits, and merchandise. The place was founded by Juan Rejon in 1478 and was the capital of the Canary Islands until 1833, when the seat of government was transferred to Santa Cruz de Tenerife. Population, *ca.* 75,000.

The name Las Palmas also refers to a cape of West Africa, lying between Liberia and the Ivory Coast.

Lassalle (*lä-säl'*), FERDINAND, socialist and economist, born in Breslau, Germany, Apr. 11, 1825; died Aug. 31, 1864. Descended from a Jewish family of merchants, he studied at Breslau and Berlin, and attained a reputation for remarkable native ability and strength of mind. At Berlin he met Humboldt and at Paris formed the acquaintance of Heine, both of whom were attracted by his advanced views in philosophy and philology. In 1845 he championed the cause of Countess Hatzfeldt, who had become separated from her husband, and after some time forced a favorable compromise. Favoring the Revolution of 1848, he was imprisoned for his democratic expressions. In 1858 he published a treatise on the philosophy of Heraclitus and in 1861 completed a work on the philosophy of law, entitled "System of Acquired Rights." Subsequently he issued many pamphlets, delivered lectures on the labor question, and organized the Social-Democratic party of Germany. He founded the Universal German Workingmen's Association at Leipzig and other similar organizations were promoted in different parts of Germany. His work, "Italian War and the Mission of Prussia," was circulated extensively and had its influence in withholding support from Austria in its war with France. In a duel fought near Geneva he was severely wounded on the morning of Aug. 28, 1864, and he died a few days later.

Lasso (*läs'sô*), a long line with a running noose, used chiefly in Spanish America, Mexico, and the western part of the U.S., for catching horses and cattle. It is usually made of rawhide, but also of sisal rope and hair. One end of the lasso is attached to the saddle, while the other has a sliding noose formed by rings, which the horseman throws over the head or around the foot of the animal while in full gallop, and thus succeeds in catching the desired animal. In the U.S. it is frequently called a *lariat* and in Mexico *la reata*.

Lasso (*läs'sô*), ORLANDO DI (ORLANDUS OF ROLAND DE LASSUS), composer, born Roland Delattre, near Mons, Belgium, 1532; died in 1594. Attaining fame as a musician, he went to Munich in 1556, becoming director of court chamber music (1560). Under the patronage of the Bavarian dukes Albert V and Maximilian II, he composed music of such distinction that he is held second only to Palestrina among 16th-century composers. Although he is best known for his sacred music, his compositions (over 2,000 in all) include motets, Italian madrigals, and French chansons.

Lastex (*läs'tĕks*), a trade name for a yarn made by spirally winding a core of rubber with thread, thus producing an elastic yarn to match the colors or material of garments in which it is used as a woven band to provide elasticity around the waist or wrists, or as a sewing thread for smocking where elasticity is desirable. Cloth made from this yarn will stretch in all directions as compared to cloth woven from non-elastic thread, which will stretch in only one direction.

Last Judgment (*läst jŭj'mĕnt*), or FINAL JUDGMENT, in Christian theology, the trial which will be held by God or Christ at the end of the world, at which time the dead will be resurrected and judgment be passed over all human beings, living and dead. It is not generally known that this concept was found in some Asiatic religions antedating Christianity, especially Indian and Persian beliefs. In Greek philosophy we sometimes find the idea of judgment immediately after an individual had passed away, but there is no reference to a general judgment. Judaism also holds the idea of judgment, but it emerged only in the post-exile stages and may be attributed to Oriental influences.

In Christianity the idea of the Last Judgment is prominently displayed in the Book of Revelation (*q.v.*). It is always a moral judgment which separates the good from the evil, the wheat from

THE LAST JUDGMENT
Sculpture from the Bamberg Cathedral, 13th century

the tares, as it is expressed in the Gospels (*q.v.*). Contradictory statements in the New Testament make it not quite clear whether God Himself or Christ will do the judging, but it is always emphasized that not only the living but also the dead will be judged.

The idea of the Last Judgment itself has become a favored topic of Christian art. We find depictions of it as early as the 6th century. Gradually, definite types developed and are shown in medieval miniatures as well as in the sculptural decorations of the great Romanesque and Gothic cathedrals from the 12th to the 15th centuries. Generally they are arranged in the tympanum (*q.v.*) above the main portal of the church. Grotesque aspects appear, showing, for example, how the resurrected climb out of their graves, how they act in fear or in joy, etc. Especially well-known frescoes of the Last Judgment are the ones by an anonymous master in the Campo Santo at Pisa; that by Luca Signorelli at the Cathedral of Orvieto, and, most noted of all, Michelangelo's "Last Judgment" in the Sistine Chapel. Almost every Renaissance (*q.v.*) or Baroque (*q.v.*) artist painted a Last Judgment, as did many Dutch, Flemish, and German masters, of which the work by Rubens is the best known. Generally, these paintings show Christ sitting in the center, sometimes with the Blessed Virgin at his right; angels accompany the blessed toward Him, while at the left the damned are thrown down by devils. We know from manuscripts that the scene was also often represented in medieval mystery plays between the 12th and the 15th centuries. In their presentation, much horseplay frequently took place, with amusing scenes executed by the devils and the sinners.

Last Supper (*süp'ēr*), one of the climactic events in the life of the Lord, as told in the four Gospels (Matthew 26:20 *ff.*; Mark 14:17 *ff.*; Luke 22:14 *ff.*; John 13:21 *ff.*). The event has been frequently depicted in the visual arts, for example, in the famous fresco by Leonardo da Vinci (*q.v.*). See *Lord's Supper; Holy Communion.*

Las Vegas (*läs vā'gäs*), county seat of San Miguel County, New Mexico, on the Gallinas River, 72 m. E. of Santa Fe. It is on the Atchison, Topeka & Santa Fe R.R., has a large trade in wool and livestock, and is surrounded by a grazing and gold and silver mining country. The chief buildings include the public library, the Castaneda Hotel, the courthouse, and the New Mexico Highlands Univ. It has extensive railroad shops, flour and lumber mills, machine shops, wool-scouring works, and brick plants. In its vicinity are the Las Vegas Hot Springs, a popular resort. It was formerly called East Las Vegas, but was incorporated as Las Vegas in 1896. Population, 1908, 8,145; in 1940, 5,941; in 1950, 7,494.

Las Vegas, county seat of Clark County, Nevada, in the southeastern section of the state, on the Union Pacific Railroad. Its dude ranches and resort hotels have made it a flourishing tourist center. Nearby are Lake Mead, Hoover (formerly Boulder) Dam, and Death Valley. Population, 1950, 24,624.

Latent Heat (*lā'tent hēt*), the quantity of thermal energy absorbed or released by a body during a physical process without temperature change. Latent heats may be classified as heats of fusion, vaporization, sublimation, and transition. In each of the first three cases the heat is absorbed during a change of state, while the last case involves a change of crystalline structure of the body. The latent heat absorbed by the body produces a change of the internal energy of the molecular structure and provides for work of expansion against external pressure.

Lateran (*lăt'ēr-an*), a celebrated church in Rome, Italy, founded by Constantine the Great and by him dedicated to the Savior. It was rebuilt in the 12th century by Lucius II and dedicated to St. John Lateran. The church was maintained in the original form up to 896, when it was

destroyed by an earthquake, but was rebuilt shortly after and has been remodeled many times. The palace annexed to it served as the papal residence until the 14th century, but is now a museum. The Scala Santa, or Holy Staircase, which is reputed to have served in the house of Pilate at Jerusalem, and to have been trod by our Lord as He passed to judgment, is preserved in the piazza of St. John Lateran.

Lateran Treaties. Name of the agreements concluded (1929) between Pope Pius XI and the Fascist government of Italy which resulted in the re-establishment of a sovereign papal state, Vatican City. See also *Italy; Vatican City.*

Latex (*lā'tĕks*), the milky juice which flows from the inner bark or cortex of certain shrubs, plants, and trees. The term is derived from the Latin and means a fluid or juice. In this sense it has been used by botanists for over 100 years to describe plant juices. In popular usage, it means specifically the rubber-containing juice of the rubber tree (as distinct from the sap of the tree which flows from the roots to the leaves in a layer located underneath the latex layer). Fresh rubber latex is milky in appearance, contains about 60 per cent of water, and from 30 to 40 per cent of rubber particles. These rubber particles can be coagulated with heat and smoke, or by the addition of acid (usually formic or acetic) to the latex. Formerly, the rubber particles were always removed from the latex and dried into crude rubber before it was used for manufacturing purposes. Recently, a certain amount of latex has been used directly in manufacture, without pretreatment, for certain purposes. The treatment of latex in manufacture differs from the treatment of dry rubber. Ingredients for compounding are added to the latex in the form of emulsions. The thickened solution of latex is then poured into molds, or coated on wire. After drying, the articles are ready for vulcanization. Rubber thread is made by extruding the compounded latex through tubes into a coagulating bath and then vulcanizing it (see *Latex*). Latex sponge for upholstery, mattresses, etc., is made by mechanically aerating the latex and adding a coagulant, followed by vulcanization. Plastic latex is a colloidal dispersion of resins in water, with plasticizers, for application to paper, wire, fabrics, packaging, and for stiffeners or as a sizing material.

Lathe (*lāTH*), a machine by which wood, metal, etc., is shaped by being rotated against a cutting tool or bit. In a small hand lathe, the bit is manipulated by hand. In an engine lathe, the bit is moved automatically by a cam or screw, or can be operated manually. The material to be machined is held in place on one end by a head stock and on the other by a tailstock, which are equipped with various types of chucks to grip different materials. Various gearing arrangements are provided for high-speed or low-speed work. Power is supplied in small lathes by a foot pedal or small motor. Large lathes are operated by gasoline, steam, or electricity. Many different lathes are in use for screw cutting, polishing, boring, or for turning out various parts of machinery, furniture, etc.

Lathrop (*lā'thrŭp*), GEORGE PARSONS, editor and author, born in Honolulu, Hawaiian Islands, Aug. 25, 1851; died in New York City, Apr. 19, 1898. He was educated in Germany and in 1871 married Rose, the second daughter of Nathaniel Hawthorne, whose works he later edited. In 1875-77 he was editor of the *Atlantic Monthly*, and afterward edited the *Boston Courier*.

Lathrop, JULIA CLIFFORD, social worker, born in Rockford, Ill., in 1858; died in 1932. After graduating from Vassar Coll., she became an authority on the care of the insane, the education of children, and juvenile law. Except when she was abroad, studying conditions in European countries, she lived and worked at Hull House in Chicago with her friend Jane Addams. She was appointed first Chief of the Children's Bureau of the U.S. Department of Labor (1912-21) and was a member of the Child Welfare Committee inaugurated by the League of Nations (1925-32).

Latimer (*lăt'i mĕr*), HUGH, reformer and martyr, born at Thurcaston, in Leicestershire, England, in 1490; suffered martyrdom, Oct. 16, 1555. He studied at Cambridge, was elected a fellow of Clare in 1510, and in 1523 was ordained a priest. He soon joined the forces of the Reformation, supported Henry VIII, and in 1535 was made bishop of Worcester. He broke with Henry VIII in 1539 and in 1546 was imprisoned for a year, for his opposition to the Six Articles, which embodied certain Catholic doctrines. He resumed his preaching and attracted huge crowds, but, with the accession of Mary I (1553), the Roman Catholic Church was re-established, and Latimer was again imprisoned. He was tried and found guilty of heresy and put to death at the stake. See *Ridley, Nicholas.*

Latin America (*lăt'ĭn*), a group of American countries inhabited largely by people of Latin stock. The countries include Mexico, Cuba, and nations of Central and South America (*qq.v.*). The chief Latin influence in the language, customs, and history of the Latin-American peoples derives from Spain. For interrelations of the Latin-American countries and the U.S., see *Pan-Americanism;* for information on literature, see *American Literature.*

Latin Monetary Union, a financial association formed in 1865 by France, Belgium, and Switzerland for the uniform regulation of their coinage. Greece joined in 1868. The established uniformity of the value of their currency virtually disappeared as a result of the inflation following

World War I, and the union was formally dissolved in 1926.

Latins (*lăt'inz*), or LATINI, the inhabitants of ancient Latium, in Italy, from whom the language of Rome was obtained. These people were of great antiquity and their distinguished leader, Ascanius, son of Aeneas, aided in building the town of Alba Longa, which was the most important of their cities. Since Rome was held as a colony of Alba Longa, the Latin language was adopted by the Romans.

Latitude (*lăt'i-tūd*), in geography, the term applied to distance north and south from the Equator, reckoned in degrees, and measured along the meridians. Latitude at the Equator is the smallest or lowest and is marked 0°, and distance from it is designated *north* or *south* respectively as the locality is north or south from the Equator. Since there are only 360° in any circle, and the distance from the Equator to the Poles is one-fourth of an entire circle, 90° is the greatest value of latitude a place can have; thus the Poles are each marked 90°. There may be any number of parallel circles imaged drawn between the Poles and the Equator, these being designated *parallels of latitude*, and if their distance in degrees from the Equator is known, it is not difficult to locate a place in latitude. When the longitude of a place is associated with its latitude, an exact locality on a sphere or map may be designated. See *Longitude*.

Latour d'Auvergne (*là-tōōr' dō-vârn'ÿ*), THÉOPHILE MALO CORRET DE, soldier, born in Carhaix, France, Nov. 23, 1743; died June 27, 1800. He studied at a military school and entered the army in 1767. For some time he served under the Duke of Crillon at the siege of Port Mahon. After the French Revolution he distinguished himself in the armies of the Alps and Pyrenees. Napoleon made him the "first grenadier of France" and sent him a sword, but he refused to accept it, saying: "Among us soldiers there is neither first nor last." He took part at the Battle of Neuburg, in Bavaria, where he fell in action. A monument was erected to his honor on the place where he died.

Latter-Day Saints (*lăt'ēr dā sānts*), CHURCH OF JESUS CHRIST OF. See *Mormons*.

Latter Day Saints, REORGANIZED CHURCH OF JESUS CHRIST OF, a body of Latter Day Saints which stands in opposition to the Mormons centered in Utah. Its separation from the main body of Mormonism dates from 1844, when the followers of Joseph Smith (*q.v.*) were scattered after his death. It was not until 1852, however, that the Reorganized Church was formed by members opposed to Brigham Young and especially to his doctrine of polygamy. The group was led by Joseph Smith's son, it claims succession from the original Church. It has headquarters, including several educational institutions, at Independence, Mo. The tenets of faith are based upon the Bible and the Book of Mormon, both of which are held to be inspired. Plural marriage is opposed, and strict discipline is enforced. There are about 868 churches and a membership of *ca.* 146,000. See also *Mormons*.

Latvia (*lăt'vi-ą*), a country of Europe, bounded by the Baltic Sea, Estonia, Russia, and Lithuania. A part of Russia before the Bolshevik Revolution, it became independent in 1920, when it was formed of Courland and parts of Vitebsk and Livonia. In 1940, it was admitted into the Soviet Union as the Latvian Soviet Socialist Republic. The area is 25,399 sq. m.

Latvia is chiefly an agricultural country, producing flax, rye, barley, oats, potatoes, and hay. Extensive productions are obtained on well-managed farms. Forestry, fishing, and manufacturing yield large returns, and there is an increasing industrial growth. Riga (population, 385,000) is the capital and chief seaport. Population, *ca.* 2,000,000. See *Letts*.

Laud (*ląd*), WILLIAM, Archbishop of Canterbury, born in Reading, England, Oct. 7, 1573; beheaded on Tower Hill, Jan. 10, 1645. He studied at Oxford, where he took a degree in 1594, and in 1601 was ordained a priest. His profound learning gained him many friends and, after holding several important positions, he was made Archbishop of Canterbury in 1633. It was designed to establish the Church of England as a branch of the Catholic Church, and with this intent he entered upon the plan of forcibly abolishing Puritanism. The Long Parliament, in 1640, impeached Laud for treason. The House of Lords deferred judgment for a long time, but on Dec. 17, 1644, he was declared guilty of high treason.

Laudanum (*ląd'ą-nūm*), the name applied to several tinctures of opium, containing about 33 grains of the soluble matter of opium, or 3.3 grains of morphine, to each fluid ounce of the tincture. Laudanum is used to relieve pain, especially in cramps and diarrhea, but should be taken only under the advice of a physician.

Lauder (*ląd'ēr*), SIR HARRY (MC LENNAN), entertainer, born at Portobello (Edinburgh), Scotland, Aug. 4, 1870; died in Strathaven, Scotland, Feb. 26, 1950. He began life working in spinning mills and in coal mines, attending school half-time. His first entertainment tour was through Ireland and Scotland, where he was greatly encouraged, and soon after he appeared in London and made tours throughout the world. He composed his own songs and music, which he rendered in Scottish dialect and in a whimsical manner. His only son lost his life in World War I. In 1919 he was knighted by King George V. His productions include "She's the Lass for Me," "Roamin' in the Gloamin'," and "Harry Lauder's Logic."

Laue (*lou'ē*), MAX (THEODORE FELIX) VON, physicist, born in Pfaffendorf, Germany, Oct. 9, 1879; died in Berlin, April 23, 1960. He attended the universities of Strasburg, Göttingen, and Munich and taught at Berlin, Munich, and Zürich. He made valuable contributions to the study of X-rays; and for his discovery of the diffraction of Röntgen rays on passing through crystals, he was awarded the Nobel Prize for physics in 1914. His research in relativity, electromagnetism, and diffraction of light was also notable.

Laughing Gas (*läf'ing*), the name of a chemical used as an anaesthetic agent, so called from the feeling of merriment or well-being which it sometimes produces when it is inhaled. The agents used for this purpose consist mainly of hyponitrous oxide, or protoxide of nitrogen.

Laughing Jackass. See *Kingfisher*.

Laughlin (*läf'lin*), JAMES LAURENCE, economist, born in Deerfield, Ohio, Apr. 2, 1850; died in Jaffrey, N.M., Nov. 28, 1933. He was graduated from Harvard Univ. (1873) and, while teaching there (1878-88), wrote "The History of Bimetallism in the U.S." (1886) and "Elements of Political Economy" (1887). He taught at Cornell Univ. (1890-92) and became head (1892) of the department of economics at Chicago Univ. An advocate of a single monetary standard and other monetary reforms, he played an important role in the establishment of the Federal Reserve System.

Laughter (*läf'tĕr*), the expression of mirth, merriment, and satisfaction by laughing. It is a sound or succession of sounds produced by a deep inspiration, followed by vocalized expulsions of air in quick interrupted succession. Laughter is caused by things of an apparent or real ludicrous nature and by tickling. Sometimes it accompanies extreme grief and hysteria. Since there is an intimate connection between the muscles of the eyelids and some of the muscles of the upper lip, in laughing, as in weeping, the eyelids are more or less contracted.

Laughton (*lô't'n*), CHARLES, actor, born in Scarborough, England, on July 1, 1899; died in Los Angeles, Calif., Dec. 15, 1962. He was educated at Stonyhurst, and later the Royal Acad. of Dramatic Art. His early roles included "A Man with Red Hair" (1928) and "Payment Deferred" (1931), a success in which he also played at the Lyceum Theater in New York (1931), later taking the lead in the film of the same name.

In 1932 Laughton left the stage and entered films, where he continued to arouse widespread interest for his unique portrayals of widely differing characterizations. He played the role of Nero in "The Sign of the Cross," and the title role in "King Henry VIII," in which he shared acting honors with his wife, Elsa Lanchester, whom he married in 1929. "Ruggles of Red Gap," in which he is notable for a rendition of the Gettysburg Address, is one of his outstanding successes. Another of his outstanding interpretations was of the painter, Rembrandt, in the picture of the same name. Other film successes in which he played the lead are: "Mutiny on the Bounty," "Jamaica Inn," "Hunchback of Notre Dame." In 1937 he formed his own film company, called the Mayflower Pictures Corp.

Courtesy United Artists Corp., N. Y.

CHARLES LAUGHTON

Laureate (*lą'rē-āt*), POET, an honorary office maintained in England, in which a poet regarded as official is invested with the title of *laureate* by the crown. The recognition of a poet laureate originated from various sovereigns who engaged singers. Among the early kings employing singers were Henry I, Richard I, Edward I, and Edward II. The term laureate itself arose from the laurel wreath given at the universities for marks of excellence in study and to men of notable poetic ability. Such a mark of distinction was bestowed by both English universities upon John Skelton, who afterward called himself *Poeta Laureatus*. Originally the title implied service, as the writing of an ode for the king's birthday and on festival occasions, particularly those celebrated after noted national victories. However, special duties have not been connected wtih the office subsequent to the reign of George III. The following have been poets laureate since the definite establishment of the office: Edmund Spenser, 1591-99; Samuel Daniel, 1599-1619; Ben Jonson, 1619-37; William Davenant, 1660-68; John Dryden, 1670-89; Thomas Shadwell, 1689-92; Nahum Tate, 1692-1715; Nicholas Rowe, 1715-18; Lawrence Eusden, 1718-30; Colley Cibber, 1730-57; William Whitehead, 1757-85; Thomas Warton, 1785-90; Henry James Pye, 1790-1813; Robert Southey, 1813-43; William Wordsworth, 1843-50; Alfred Tennyson, 1850-92; Alfred Austin, 1896-1913; Robert Bridges,

1913-30; John Masefield, 1930- . Interims occurred in 1637, 1668, and 1892.

Laurel (*lą'rĕl*), a genus of plants which range in size from a shrub to trees 60 ft. in height. They are natives of Europe, Asia, and Africa, chiefly in the countries bordering on the Mediterranean, but have been acclimated extensively in different countries. Several species are cultivated as ornamental plants and for their fine aromatic fragrance. The leaves are lanceolate and evergreen, the flowers are yellowish-white, and the fruit is about an inch long and of a bluish-black color. The flavor of the leaves is utilized in culinary arts and as a stimulant and carminative in medicine. Several oily substances are extracted from the leaves and the fruit, such as oil

U. S. Forest Service Photo

LAUREL

of sweet bay and oil of laurel. Laurel water is obtained by distillation from the leaves. In America the name is given to several native plants, including those known as the cherry laurel and purge laurel, but of the true laurel there is properly but one species. The true laurel and the noble laurel are somewhat similar in their evergreen foliage, but differ botanically. Wreaths and crowns were made of laurel twigs in ancient times by the Greeks, as a decoration for the heads of heroes.

Laurel, county seat of Jones County, Mississippi, 70 m. S.E. of Jackson, on the Southern, the Illinois Central, and other railroads. It is in a farming section and has machine shops and lumber mills, a courthouse and a Federal building. It has a large trade. The place was settled and incorporated in 1890. Population, 1950, 25,038.

Laurencin (*lō-rän-sän'*), MARIE, painter and lithographer, born in Paris, France, Oct. 31, 1885; died there, June 8, 1956. Her work attracted the attention of Braque, Picasso, and others early in her career, and she showed influences of the Fauvist and cubist styles. She first exhibited paintings in Paris in 1907. Later she designed costumes and sets for the Comédie Française and for Diaghilev's Ballet Russe, in addition to illustrating books for André Gide and other contemporary French authors. Her usual subject matter included circus figures and young girls, delicately executed in pale pastels—quiet tones of pink, blue, and gray—with a characteristic lack of detail.

Laurens (*lą'rĕns*), HENRY, statesman, born in Charleston, S.C., in 1724; died there Dec. 8, 1792. From 1777 until 1780 he was a delegate to the Continental Congress, serving as its president several years, and in 1779 was appointed minister to Holland. While on his way to Europe, he was captured by the British and confined for 15 months as a prisoner in the Tower. He was appointed afterward as a peace commissioner with Jay and Franklin, and in 1782 signed the preliminary treaty of Paris by which peace was restored with England.

Laurens (*lō-rän'*), JEAN PAUL, historical painter, born at Fourquevaux, France, Mar. 28, 1838; died Mar. 23, 1921. He studied in Toulouse and in Paris. In 1872 he was awarded a first-class medal at the Salon, became an officer of the Legion of Honor in 1878, and was made a member of the Institute in 1891. He is considered among the best of modern historical painters. Among his chief works are: "The Pool of Bethesda," "The Vengeance of Pope Urban VI," "Two Scenes from the Life of St. Geneviève," "A Voice in the Desert," "The Death of Tiberius," "Excommunication of Robert the Pious," and "Release of the Prisoners."

Laurens (*lą'rĕns*), JOHN, soldier and patriot, born in Charleston, S.C., in 1753; killed in battle, Aug. 27, 1782. The son of Henry Laurens, he was educated in England, and in 1777 became an aide to Washington, serving with that general in all the battles of the Revolution in which the latter commanded. Washington dispatched him to France in 1781 to obtain money and supplies, but he returned in time to participate in the Battle of Yorktown. While in active service under Gen. Greene, in a battle on the Combahee River, South Carolina, he was mortally wounded. His correspondence was published in 1867.

Laurentian Mountains (*lą-rĕn'shĭ-ąn*), the mountain range of British America that divides the St. Lawrence basin from the watershed of Hudson Bay. These highlands separate the upper tributaries of the Mackenzie from the streams

flowing into the same bay. It extends in an irregular curve from Labrador to the Arctic, a distance of about 3,000 m. The highest peaks are 4,000 ft., the average height is 1,500, and the principal rock formations belong to the archaean system.

Laurier (*lô'rĭ-â*), SIR WILFRID, statesman, born in St. Lin, Quebec, Nov. 20, 1841; died Feb. 7, 1919. He was educated at L'Assomption Coll., received a degree from McGill Univ. in 1864, and became queen's counsel in 1890. From 1871 until 1874 he served in the Quebec Assembly, then entered the Dominion Parliament, and in 1877 was made Minister of Inland Revenue. In 1891 he became leader of the Liberal party, was made Premier in 1896, and in 1898 secured an appointment on the Anglo-American joint high commission. His government was endorsed by a decisive vote in the election of 1908, but his party was defeated in 1911, on the issue of reciprocity in trade with the U.S. In 1917 his party opposed compulsory military service, favoring voluntary enlistments instead, and was again defeated.

Laurium (*lą'rĭ-ŭm*), a village of Upper Michigan, in Houghton County, 15 m. N.E. of Houghton. It is on the Mineral Range and the Copper Range R.R.'s., and is surrounded by one of the richest copper-mining regions of North America. The industries consist chiefly of machine shops and enterprises connected with the mining of copper. In the vicinity are several villages, including Red Jacket. The name formerly was Calumet, but it was changed to Laurium in 1895. Population, 1940, 3,929; in 1950, 3,211.

Lausanne (*lô-zăn'*), capital of the canton of Vaud, Switzerland, near the northern shore of Lake Geneva. It occupies a site about 500 ft. above the level of the lake and is built mainly on the lower slopes of Mt. Jorat. The chief buildings include a Gothic cathedral built in 1235, in which Farel and Calvin took part with others in famous disputations. It is the seat of a university, an academy for Protestant ministers, a school of agriculture, and several charitable institutions. The manufactures include tobacco, machinery, clothing, and jewelry. Lausanne is visited by many tourists during the summer, who find entertainment at numerous fine hotels. It is the seat of a bishopric, of the supreme court of the republic, and of the cantonal library with 125,000 volumes. The city was founded about the 6th century. Population, *ca.* 70,000.

Lausanne, TREATY OF, a convention concluded at Lausanne, Switzerland, in 1923 to adjust differences between Turkey and the great powers of Europe. By its terms the Treaty of Sèvres was abrogated, Turkey regained territory in Europe, peace was concluded between Greece and Turkey, and the Straits (Dardanelles and Bosporus) as well as the Black Sea were made neutral territory.

Lava (*lä'vä*), a term generally applied to all molten matter thrown from volcanoes, whether flowing as a stream or being deposited after the movement has ceased. When moving in a molten state within the volcanic channel, it is properly called trap, and after being deposited it forms basalt, trachytic greenstone, or tufa, depending upon the degree of rapidity with which it cools, the cooling action influencing the formation of hornblende, feldspar, augite, and various other substances. The stream cools and hardens more rapidly on the surface, which causes it to become honeycombed as a result of escaping gases from the interior, while the interior continues to flow in a liquid state for some time, but after the heat escapes it forms a compact mass. The lavas thrown out by Etna and in Labrador are largely feldspar, those of Vesuvius are principally green augite and basalt, and those of the Peak of Teneriffe consist chiefly of trachytic masses.

Laval (*là-văl'*), capital of the department of Mayenne, France, 45 m. E. of Rennes. It has railroad and electric railway facilities and contains a cathedral which was begun in the 12th century. The manufactures include linen goods, leather, clothing, and marble products. It has a brisk trade in merchandise and cereals. Population, *ca.* 31,000.

Laval, PIERRE, politician, born in Auvergne, France, June 28, 1883; died Oct. 15, 1945. A village school teacher at 18, Laval later studied law and did newspaper work. He became a member of the Chamber of Deputies in 1914, originally as a Socialist, later as a Republican (1924). From the middle of the 1920's until the fall of the Third Republic (June 1940), he was almost continuously a member of the cabinet in various capacities, serving twice as premier (1931-32 and 1935-36). Acting for Marshal Pétain (*q.v.*), he established an authoritarian government in France under German control after the defeat of France (June 1940) in World War II. Although he was removed from office in December 1940, and an attempt was made on his life in August 1941, he was returned to power in April 1942, as Chief of Government, thereafter devoting all his efforts to helping the German war lords in the suppression of the French people as well as against the Allies after they invaded France (June 1944). During the Allied liberation, Laval fled to Germany, but arrived in Spain shortly before the defeat of the Nazis; later, refused refuge there, he returned to France, where he was convicted of intelligence with the enemy and executed.

Laval-Montmorency (*là-văl'-môn-mô-rän-sē'*), FRANÇOIS XAVIER DE, first Roman Catholic Bishop of Canada, born in Laval, France, Mar. 23, 1622; died in Quebec, May 26, 1708. He is known by his family title, Abbé de Montigny, which was applied to him more or less frequently both in America and Europe. He was ordained priest in

1646. In 1658 he was consecrated as Bishop of Quebec and the following year reached New France, where he organized parishes and vigorously prosecuted religious work. Laval Univ. was named in his honor.

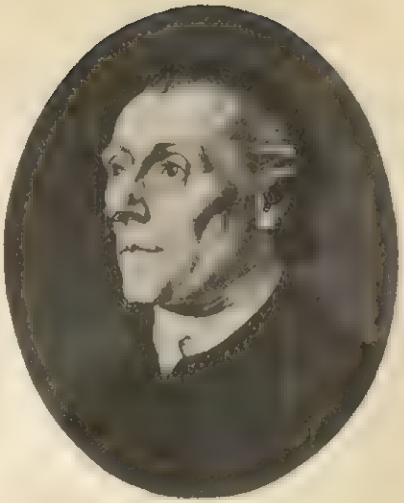
Laval University, an institution of higher learning at Quebec, Canada. It was created (1852) by the Quebec Seminary and granted a royal charter in December of the same year. By virtue of its charter, the Catholic Archbishop of Quebec has the right of veto over all the rules and nominations. The superior of the Quebec Seminary is *de jure* the rector, or principal, of the university. The faculties include those on theology, law, medicine, arts, canon law, philosophy, letters, sciences, agriculture, social sciences, and surveying and forestry. Many other schools such as the Schools of Pedagogy, of Commerce, of Music, of Fisheries, of Social Service, of Nursing, are connected with one or the other faculty. The degrees which the students may obtain are those of bachelor, master or licentiate, and doctor.

Laval Univ., in order to be ranked as a Catholic institution, was bound to be acknowledged and canonically erected by the Holy See. This was granted by Pope Pius IX, in a bull of April 1876.

Nearly 30 men's or women's colleges are affiliated with the university. In ordinary times, the faculty, excepting the affiliated colleges, consists of about 500 instructors, and the student enrollment, including the students of the affiliated colleges, reaches about 13,500 annually.

Each summer, a thousand people come to Laval for a five-week session. Several hundred come from the U.S. and English provinces of Canada for the purpose of studying French or philosophy. French Canadians are also offered summer courses in theology, philosophy, English, Spanish, Portuguese, and education.

Lavater (*lä'vä-tĕr*), JOHANN KASPAR, Protestant pastor and physiognomist, born in Zurich, Switzerland, Nov. 15, 1741; died Jan. 2, 1801. During his studies, he became interested in literature, particularly the work of Klopstock which was later to influence his own writing. In 1762, he aroused interest by denouncing the measures of a corrupt magistrate, and, in 1767, published a volume of poems entitled "Swiss Songs." He was ordained in 1769, and for many years served as a deacon or pastor in various Zurich churches, notably the Church of St. Peter (1786). He was a man of considerable following and was much respected for his convictions and his ability as an orator. An advocate of religious liberty, his ideas spread throughout Switzerland and Germany, and even to France during the Revolution. His mystical religious writings were very popular at the time but have since largely been



JOHANN KASPAR LAVATER

forgotten. A three-volume work known as "Prospects of Eternity" was published in several editions. The "Christliche Lieder" appeared between 1776 and 1780. Two epics, "Jesus Messias" (1780) and "Joseph von Arimathia" (1794), showed the influence of Klopstock. Lavater was better known for his "Physiognomical Fragments" which enjoyed a great vogue in France, England, and Germany, partly because of beautiful format and illustrations. Although unscientific, it was widely translated as an authoritative text on the subject. Lavater's death resulted from an injury received during the French occupation of Switzerland.

Lavender (*lăv'ĕn-dĕr*), a genus of plants native to Southern Europe and Western Africa, but now widely naturalized and cultivated. They grow as shrubs from 2 to 4 ft. tall, have hoary leaves and grayish-blue flowers, and are prized for their fragrant, volatile oil contained in the flowers and used in perfumery. The oil has a bitter principle, is of a pale yellow color, and is obtained by distilling the flowers with water. Besides its use in perfumery, oil of lavender is employed successfully as a stimulant in colic, hysteria, and other affections. Lavender water is a toilet preparation and is secured by dissolving oil of lavender with musk, cloves, attar of roses, bergamot, and other oils in spirits. The spirit of lavender is obtained by distilling fresh flowers in rectified spirits. A species of broad-leaved lavender yields an oil used in preparing varnishes and ornamenting porcelain products. The American perfume known as Florida water is prepared largely from lavender. Lavender is cultivated most largely in Europe, where it is used for the distillation of its essential oil and for marketing the flowers. Considerable quantities are grown in the U.S., particularly in Pennsylvania, New Jersey, and the states of the Pacific coast.

Laveran (*lav-rän'*), CHARLES LOUIS ALPHONSE, physician, born in Paris, France, in 1845; died May 18, 1922. He studied in Paris and Strasbourg and, in 1873, became a professor at the École du Val de Grâce. In the interests of military hygiene, he was sent to Africa (1878-83) to investigate malarial fevers then prevalent in Algeria. Laveran made the first substantial contribution to malariology by discovering the cause, a microscopic parasite in the blood, and demonstrating that it was introduced by the bites of mosquitoes. For these achievements, he was elected to the French Acad. of Sciences and awarded the 1907 Nobel Prize for medicine. He served for some years as chief physician at the Lille Hospital and published a number of studies on the treatment of diseases.

Lavoisier (*là-vwä-zyā'*), ANTOINE LAURENT, chemist, born in Paris, France, Aug. 26, 1743; guillotined May 8, 1794. He introduced the first rational nomenclature into chemistry, distinguishing elements from their compounds such as acids, bases, and salts. He served on a commission to establish the metric system of weights and measures. He studied the composition of air and discovered oxygen almost simultaneously with Scheele in Sweden and Priestley in England, and furthermore, he recognized the role of oxygen in combustion and in respiration. By means of the balance scales, he proved that certain substances called earths, chalk, barytes, and magnesia are compounds of oxygen and not simple elements as had been previously assumed. He produced oxides of metals by combustion in air in a closed vessel, and he demonstrated that metal gains in weight when it assumes the "earthy appearance" under such treatment and that the air loses as much as the metal gains.

ANTOINE LAVOISIER

Experimenting on human respiration

This quantitative work with the balance in analyzing inorganic oxides and making them synthetically led him to the principle which bears his name, the law of conservation of matter, *"Rien ne se perd, rien ne se crée,"* as he first expressed the idea that matter is neither lost nor created. This principle became the cornerstone of analytical chemistry. He also introduced quantitative thermochemical methods, and with La-Place attempted to measure the heats of combustion of chemical compounds and the heat balance of the animal body. He recognized that as much heat is required to disrupt a compound as is liberated when the compound is formed from its elements. To defray the cost of his researches, he sought and obtained a post as "Farmer-General," with power to collect taxes. Unfortunately, this class of officials, appointed by the crown, fell into great disfavor during the French Revolution (*q.v.*), and the group as a whole was tried, condemned to the guillotine, and executed.

Law (*lô*), the collective body of regulations adopted by the government to regulate human conduct. The system of law which is enforced in a particular state or nation is known as its *municipal law*, while the system of rules acknowledged to be obligatory upon the nations is termed *international law*. Municipal law is divided into civil and criminal law. *Civil law* embraces all the provisions that regulate or protect the members of a community, except those that relate to the definition and provide for the punishment of public offenses, which constitute the code of *criminal law*. The acts of Congress and of the general assemblies, as defined by the decision of the courts, comprise the *written law*, while maxims and customs in use from time immemorial are known as the *common law*. Those portions of the law which are expressed in statutes and constitutions are denominated, respectively, *statute law* and *constitutional law*. *Administrative law* includes the regulations which limit and define the duties of the officials of the government and provide penalties for violations of the same. *Canon law* has reference to matters of ecclesiastical jurisdiction. The constitution of a nation is the supreme law of the land. To it are subject the constitutions of the various states and provinces, which are likewise limited by a constitution of their own. A law that is not in harmony with the constitution of the nation, or of the state or province in which it is enacted, is said to be *unconstitutional*. See also *Arbitration; United Nations*.

Law, ANDREW BONAR, statesman, born in New Brunswick, Canada, Sept. 16, 1858; died in London, England, Oct. 30, 1923. He went to Scotland as a boy, and, after completing his education and acquiring some business experience, he became (1900) a Conservative member of Parliament.

He was a strong supporter of Prime Minister Balfour (see *Balfour, Arthur James*) and took a stand for tariff reform. In 1911 he became opposition leader of the Conservative party in the House of Commons, and with the establishment of the Conservative-Liberal coalition government in 1915 he became colonial secretary. He worked closely with Prime Minister Herbert Henry Asquith, being responsible for passage of the Compulsory Service bill. He proposed and took part in the economic conference of the Allies in 1916. He backed David Lloyd George (*q.v.*) for the post of prime minister, and he served in his cabinet from 1916 to 1918 as chancellor of the exchequer and Conservative party leader in Commons. In 1919 he signed the Versailles Treaty as British representative. After the war, his health somewhat impaired, he took the less taxing post of lord privy seal, but he continued as party leader. When the coalition government showed signs of falling in 1922, Law formed a Conservative government, with himself as prime minister, but he served for less than a year before his health gave way, and he retired in the spring of 1923.

Law, JOHN, financier, born in Edinburgh, Scotland, April 21, 1671; died in Venice, Italy, March 21, 1729. As a young man, he went to London, where he studied business, finance, and political economy, but in 1694 he was forced to flee the city after a duel in which he killed his opponent. He spent several years in Amsterdam, where he became interested in banking, and in 1705 he returned to Edinburgh. He advanced a proposal that Scotland institute a system of paper money, but his plan was blocked, largely through the opposition of William Paterson (*q.v.*). In 1716 he succeeded in securing authorization to form a Banque générale in France; in 1718 it became the Banque royale, with its notes guaranteed by the king, and the enterprise was highly successful. In 1717 Law founded the Compagnie de la Louisiana ou d'Occident, which acquired commercial control over vast territory in the New World; the company was consolidated with others until it reached the proportions of a great monopoly. In 1720 Law's Banque royale was merged with the company, and the combine was given virtual financial control over France, along with responsibility for the national debt. Speculation in the shares of the "Mississippi Scheme" raised their price out of all proportion to the possibilities of profit, and in May 1720 the paper currency was devalued by half. Panic ensued. The Banque royale failed, and Law was removed from office. Despite this fiasco, he was asked by Russia to reorganize that nation's finances. He declined the offer and returned to England; in 1725 he went to Italy, where he remained until his death. See also *Mississippi Scheme.*

Lawes (*lȧz*), HENRY, composer, born in Dinton, Wiltshire, England, in December 1595; died on Oct. 21, 1662. Lawes is perhaps best known for his association with John Milton, to whom he suggested the composition of "Comus," for which he subsequently wrote the incidental music (1634). It was he for whom Milton wrote the famous sonnet which begins, "Harry, whose tuneful and well-measured song . . ." His coronation piece, "Zadok the Priest" (1660), and his three books of airs (1653, 1655, and 1658) are among the finest compositions in 17th-century English music. He also wrote the music for the masque *"Coelum Britannicum,"* by Thomas Carew (*q.v.*), in 1634. After his death he was honored with burial in Westminster Abbey.

Lawes, LEWIS EDWARD, penologist, born in Elmira, N.Y., Sept. 13, 1883; died in Garrison, N.Y., April 23, 1947. At 18, Lawes enlisted in the U.S. Army, and he served for three years. Subsequently he held various posts in New York state prisons and reformatories (1905-20). He served as warden at Sing Sing prison, Ossining, N.Y., from 1920 to 1941 and achieved a nationwide reputation for his modern methods, his advocacy of education for convicts, and his opposition to capital punishment. Among his books on penology are "Twenty Thousand Years in Sing Sing" (1932), and "Stone and Steel" (1941).

Lawn Mower (*lȧn mō'ẽr*), a machine for cutting ornamental grass. The mower may be pushed by hand or operated by motor. The cutting is done by blades, which may be of the reel or the rotary type. The reel blades are mounted in spirals; they pass across a fixed knife in the manner of scissor blades. The blades of the rotary type have a cutting action similar to that of a sickle. Many power mowers are equipped with a seat for the operator. Modern mower features include baskets to collect the grass as it is cut, grass strippers to keep the drive chain free of long grass and weeds, and attachments by which the mower can be converted to such other uses as tilling, fertilizing, and aerating the soil.

Lawn Tennis (*tẽn'is*), a ball game played by two or four persons on a court of grass or other surfacing material. See *Tennis.*

Lawrence (*lȧ'rẹns*), a city in Kansas, seat of Douglas County, on the Kansas River, 28 m. s.w. of Leavenworth. It is served by the Union Pacific; the Atchison, Topeka & Santa Fe; and the Kansas City, Kaw Valley R.R.'s. The surrounding region is agricultural, and Lawrence is a processing and shipping center for its produce. Among the manufactures are feeds, seeds, fertilizer, pipe organs, and paper, lumber, and food products. A dam across the Kansas River provides electric power. Lawrence is the site of the Univ. of Kansas and of Haskell Inst., an Indian school. Founded in 1854 and incorporated

in 1858, Lawrence was a center of the Free State party (1854-60) and an important station on the Underground Railroad (*q.v.*) during the Civil War. Population, 1960, 32,858.

Lawrence, a city and port of entry in northeastern Massachusetts, on the Merrimack River, 26 m. N.W. of Boston. It is served by the Boston and Maine R.R. Manufactures of the city include electronics, footwear, textiles, machinery, paper products, plastics, furniture, and wearing apparel. The city is a part of the Lawrence-Haverhill, Mass.-N.H. standard metropolitan statistical area (163 sq. m.; pop., 1960, 187,601) which includes parts of Essex County, Mass., and parts of Rockingham County, N.H. The area had a value added by manufacture, 1958, of $267,246,000; the city's value added was $90,549,000. The city was formed in 1848 and incorporated in 1853. Its decade of greatest growth was 1900-10, when the population rose from 62,559 to 85,892. In 1950 the population was 80,536; in 1960, it declined to 70,933.

Lawrence, SAINT, celebrated martyr of the early church, probably born at Huasco, Spain, in the beginning of the 3d century, martyred Aug. 10, 258. He was a deacon of Rome under Sixtus I in the 3d century. According to legend, he was summoned by the persecutors of Emperor Valerian before the praetor and a demand was made for him to deliver the church treasures. In response he brought forward the poor and sick, declaring them his treasures, and after persistent refusal to turn over the church valuables he was roasted on a gridiron. A church was built to his memory by Constantine the Great. August 10 is designated as his feast.

Lawrence, ABBOTT, merchant and philanthropist, born in Groton, Mass., Dec. 16, 1792; died in Boston, Aug. 18, 1855. In 1814 he formed a partnership with his brother Amos, and the firm conducted a large domestic and foreign commission trade in cotton and woolen goods, producing a vast fortune. Abbott was elected to Congress in 1838, where he served in 1839-40, and in 1849-52 was U.S. minister to Great Britain under an appointment of President Taylor. He served on the commission that settled the northeast boundary in 1842 and as a commissioner to settle the fishery question. At Harvard Univ. he established the Lawrence Scientific School by bequeathing $100,000 for that purpose, gave Harvard $50,000 for the erection of model lodging houses, and made liberal donations to the Lawrence Acad.

Lawrence, AMOS, merchant and philanthropist, brother of Abbott Lawrence, born in Groton, Mass., Apr. 22, 1786; died Dec. 31, 1852. He began his commercial career by clerking in a dry goods store, and in 1814 formed a partnership with his brother. The firm established a cotton mill at Lowell in 1831, and was highly successful in its foreign trade. Amos gave about $700,000 for charitable and educational purposes to the Lawrence Acad., the Child's Infirmary at Boston, and $10,000 for the completion of the Bunker Hill Monument. Other donations were made to the Theological Sem. at Bangor, to Kenyon and Williams Colls., and to Lawrence Univ. in Wisconsin. His "Life and Correspondence" was published by his son in 1855.

Lawrence, DAVID HERBERT, author, born in Nottinghamshire, England, Sept. 11, 1885; died near Nice, France, Mar. 2, 1930. Writing boldly realistic plays, poetry, and essays, as well as the psychological novels which have occasioned much controversy, Lawrence was increasingly concerned with problems of sex, and his striking analysis of the sex motive became characteristic of his work. Younger writers, whom he greatly influenced, hailed him as an original genius. Among his best known works are the novels "The White Peacock" (1911), "Sons and Lovers" (1913), "The Rainbow" (1915), "Women in Love" (1921), and "Lady Chatterley's Lover" (1929); poetry, "Love Poems and Others" (1913), "Pansies" (1929), and "Collected Poems" (1929); essays, "Mornings in Mexico" (1927); drama, "David" (1926); and miscellany, "Psychoanalysis of the Unconscious" (1921).

Collection of Philip C. Duschnes, N. Y.

D. H. LAWRENCE

Lawrence, ERNEST ORLANDO, physicist, born in Canton, S.D., Aug. 8, 1901; died in Palo Alto, Calif., Aug. 27, 1958. Educated at South Dakota and Yale universities, he taught at Yale (1925-28) and at the Univ. of California, where he was professor of physics after 1930. During his research on the structure of the atom (*q.v.*), he invented (1931) the cyclotron ("atom smasher"). He successfully effected the transmutation of

ERNEST LAWRENCE
At his 60-in. medical cyclotron
Photo by D. Cooksey

atoms in various elements and studied the interaction of radiation and matter on applications of physics to biology and medicine. He won the 1939 Nobel Prize in physics. With Arthur Compton and Harold Urey, he headed the atomic bomb (*q.v.*) project. In 1957 Lawrence received the Enrico Fermi Award. See also *Accelerators.*

Lawrence, GERTRUDE, actress, born Gertrud Alexandra Dagmar Lawrence Klasen, in London, England, July 4, 1902; died in New York City, Sept. 6, 1952. She was married (1940) to Richard S. Aldrich, theatrical producer. After studying dancing and acting in London, she made her debut there as a child actress (1908), later starring for the most part in musical comedies and revues. She made her American debut (1924) in New York City. Among her memorable roles were the leading parts in "Oh, Kay!" (1926), "Private Lives" (1930), "Tonight at 8:30" (1936-37), "Susan and God" (1935), "Skylark" (1939-40), "Lady in the Dark" (1941-43), and "The King and I" (1951). She also was a highly successful radio performer and appeared (1950) on the screen in "Glass Menagerie." In 1945, she published her autobiography, "A Star Danced."

Lawrence, JAMES, naval officer, born in Burlington, N.J., Oct. 1, 1781; died June 5, 1813. He became lieutenant in 1802, distinguished himself in the war with Tripoli, and in 1811 became captain of the *Hornet.* In the engagement off the mouth of the Demerara River, British Guiana, in 1813, he sank the British brig-of-war *Peacock,* and for this service received the thanks of Congress. He commanded the frigate *Chesapeake* in an engagement with the British frigate *Shannon* near Boston, was mortally wounded, and when carried below exclaimed, "Don't give up the ship!" A monument was erected in his honor in Trinity Church churchyard, New York City.

Lawrence, JOHN LAIRD MAIR, statesman, born at Richmond, England, Mar. 24, 1811; died June 27, 1879. He studied at Haileybury Coll. and in 1829 entered the civil service in India. In 1846 he was made chief commissioner of the Punjab, which enabled him to exercise a wide and favorable influence upon the Sikhs during the mutiny of 1857. His success in cooperating with Havelock and Clyde won for him the popular name of the "Savior of India." In 1863 he was made governor general, serving until 1868, and the following year was created Baron Lawrence.

Lawrence, MARJORIE FLORENCE, singer, born at Deans Marsh, Victoria, Australia, in 1908. She studied voice in Paris and achieved a great musical success in Wagnerian roles throughout Europe. Coming to the U.S., she made her debut with the New York Metropolitan Opera Company in 1935, thereafter singing with opera companies in Chicago, San Francisco, Los Angeles, St. Louis, and Buenos Aires, until her career was interrupted (1941) by an attack of infantile paralysis. She recovered and made a gallant return to the operatic stage a year later.

Lawrence, SIR THOMAS, portrait painter, born in Bristol, England, May 4, 1769; died in London, Jan. 7, 1830. He began sketching in crayons at the age of 10 and became a student at the Royal Acad. at 18. In 1791 he was elected an associate of the academy and attained to full membership in 1798. The prince regent knighted him in 1815 and five years later he became president of the Royal Acad., succeeding Benjamin West. Lawrence was, like his contemporaries Sir Joshua Reynolds (*q.v.*) and Thomas Gainsborough (*q.v.*), an excellent portraitist, capturing with his brush in well-shaded colors characteristics of English aristocracy. He was equally interested in the charms of childhood as a subject in art. See illustration on the following page.

Lawrence (SHAW), THOMAS EDWARD, known as *Lawrence of Arabia,* archeologist and author, born in Caernarvonshire, Wales in 1888; died in 1935. Educated at Oxford Univ., he joined the staff of the British Museum expedition which did excavation work on the Euphrates River (1910-14). At the outbreak of World War I, Lawrence served in the British Secret Service at Cairo, in which capacity he instigated an Arab revolt against Turkish supremacy (1917-18) and, living among them and mastering their language, he rallied Arab forces to aid the British. His experiences with the Arabs are described in his popular books "The Seven Pillars of Wisdom" (1926) and "Revolt in the Desert" (1927). Arab representative at the Paris Peace Conference in 1919, Col. Lawrence later served in an advisory capacity in the British Colonial Office (1921-22). After this

Courtesy Metropolitan Museum of Art, N. Y.

THE BEST CHILDREN

PAINTING BY THOMAS LAWRENCE

he withdrew from the public eye, joining the Royal Air Force under assumed names (Shaw, Ross). He was killed in a motorcycle accident on May 19, 1935.

Lawrenceburg (*lô'rĕns-bûrg*), a city and port of entry in southeastern Indiana, seat of Dearborn County, on the Ohio River, 80 m. S.E. of Indianapolis. It is on the New York Central and the Baltimore & Ohio R.R.'s. Manufactures of the city include lumber products, tools and machinery. It was settled in 1802 and incorporated in 1847.

Courtesy Museum of Modern Art, N. Y.

T. E. LAWRENCE

Bust by Eric Kennington

Population, 1950, 4,806; in 1960, 5,004.

Layard (*lā'ärd*), SIR AUSTEN HENRY, traveler, and diplomatist, born in Paris, France, Mar. 5, 1817; died July 6, 1894. Descended from well-to-do parents, he spent his early life in Italy, and studied law in Paris and London. In 1839 he started on an overland tour to Ceylon. He began excavations on the site of Nineveh in 1845, having secured a fund of $15,000 by vote of Parliament, and sent to the British Museum many relics of historic interest. About the same time he published "Nineveh and Its Remains" and "Monuments of Nineveh." In 1852 he became a member of Parliament, was undersecretary of foreign affairs in 1861-66, and was appointed ambassador to Madrid in 1869. Under Lord Beaconsfield he became ambassador to Constantinople in 1887. He received honorary degrees from Oxford and Aberdeen Univs.

Layman (*lā'mạn*), from the Greek *laos* meaning people, term used in theology to signify a simple member of the community as opposed to the learned clergy. It is more generally used today to characterize a man who is not an expert in a given field.

Lazarus (*lăz'ȧ-rŭs*), meaning God has helped, the name given by Jesus to the beggar in the parable of the rich man and Lazarus (Luke 16:19-31). The name Lazarus was that of the brother of Mary and Martha, who was a friend of Jesus. It is related in John 11:1-44, that Jesus raised him from the dead.

Lea (*lē*), HENRY CHARLES, author, born in Philadelphia, Pa., Sept. 19, 1825; died Oct. 24, 1909. His principal works include: "Chapters From the Religious History of Spain," "Superstition and Force," "History of the Inquisition," "Essays on the Wager of Battle," "Indulgences in the Latin Church," and "Ordeal and Torture."

Lea, HOMER, soldier and writer, born in Denver, Col., Nov. 17, 1876; died Nov. 1, 1912. He was active in the relief of Peking during the Boxer rebellion, and later (1909) became a general in the Chinese army, serving in an advisory capacity rather than in actual warfare, since he was a hunchback. He was a close associate of the Chinese reformer and adviser to Emperor Kuang Hsü, K'ang Yu-wei. Lea was also associated with Dr. Sun Yat-sen, the "father of the Chinese revolution," during an early phase of the revolution (1911-12). He achieved posthumous notice during World War II because of a book he had written in 1909, "The Valor of Ignorance," in which he attempted to show how Japan could invade the U.S. and did show the error of relying on localized coastal defenses; his neglected theories were proved painfully correct by the Japanese capture of Manila and Singapore.

Lea, LUKE, American journalist and legislator, born in Nashville, Tenn., Apr. 12, 1879; died there Nov. 18, 1945. After studying at the Univ. of the South and Columbia Univ., he began practicing law at Nashville in 1903, later becoming publisher and editor of the Nashville *Tennessean*. From 1911-15 he served in the U.S. Senate. At the outbreak of World War I, he organized a field artillery regiment in which he became a lieutenant colonel. In 1918, after the defeat of Germany, he led an unsuccessful expedition into Holland to kidnap the Kaiser. He was imprisoned (1934) for defrauding a bank, being paroled in the same year.

Leacock (*lē'kŏk*), STEPHEN BUTLER, economist and writer, born in Swanmoor, England, Dec. 31, 1869; died Mar. 28, 1944. Leacock was educated in Canada and took his Ph.D. at the Univ. of Chicago (1903). He was a member of the faculty of McGill Univ. in Montreal for 35 years (1901-36), first as professor of political economy and then as head of the department of economics (1908-36). He is highly esteemed by economists as the author of "Elements of Political Science" (1906) and "Economic Prosperity in the British Empire" (1930); he is beloved by the general public as the author of delightful humorous essays in such volumes as "Literary Lapses" (1910), "Frenzied Fiction" (1917), "My Discovery of England" (1927), "Afternoons in Utopia" (1937), and "My Remarkable Uncle" (1940).

Lead (*lĕd*), element No. 82, a dense metal of bright silver color, which upon exposure is oxidized on the surface to a dull grayish color or to white. Its specific gravity is 11.3, melting point 327° C., and boiling point 1470° C. It is soft or malleable and has little tensile strength. It is a fairly good conductor of electricity. Lead is the end disintegration product of the radioactive series of metals. For example, uranium, after it has emitted alpha or beta particles through 14 transformations finally is reduced to an isotope of lead (mass No. 206), which is a stable material. Since the rate of disintegration of uranium is known, the age of uranium-bearing rocks can be determined from the relative amounts of uranium and lead which they bear.

Lead ores are widely distributed throughout the world, but the largest deposits are found in the U.S., notably Missouri, Idaho, Utah, and Montana; in Canada, Australia, Mexico, Africa, Norway, and Spain. The chief ores from which lead is extracted are galenite or galena, cerusite, and anglesite. The extraction process consists of mixing a portion of roasted lead sulfide with raw ore, coke, and limestone in a blast furnace. The burning carbon and carbon monoxide formed assist the sulfides as reducing agents, and the lead oxide is reduced to lead which may also contain gold, silver, or other minerals present in the ore. The lead is finally purified electrolytically, or, if the impurity is silver, by the Parkes process in which zinc is added to the molten mass. The silver unites with the zinc, forming a crust on top of the liquid lead.

Lead protects itself against most oxidizing agents by forming a film of lead chloride, or sulfate, or carbonate, over its surface, which protects it from further attack. It is vulnerable to weak nonoxidizing acids, such as acetic acid: to dilute nitric acid; and to concentrated sulfuric acid. Lead and all its compounds are poisonous (see *Lead Poisoning*). Though lead is used for water pipes, the water contains impurities which oxidize the lead on the surface and this film protects the lead from absorption into the water. Rain water or very soft water should not be conducted through lead pipes.

Lead has two valences, +2 and +4. It unites with oxygen to form four oxides: Lead monoxide or litharge, PbO; lead dioxide or lead peroxide, PbO_2; lead trioxide or lead sesquioxide, Pb_2O_3; and lead tetroxide, or minium, or red lead, Pb_3O_4. *Litharge* is made by heating carbonate of lead, or by heating lead in a blast of air. Its color ranges from yellow to orange, and the light brown form is called "massicot." It is chiefly used in paints, for glazing, in glass, and in other lead compounds. When mixed with glycerin it becomes an excellent cement for glass or stone. *Lead dioxide* is prepared by the action of bleaching powder on sodium plumbite. It is used in storage batteries and in explosives. It is a good oxidizing agent. *Lead sesquioxide* is prepared by the gentle heating of lead. It is a reddish powder used in ceramics, metallurgy, and paint pigments. *Red lead* is obtained by heating litharge under a current of air. It is important as a pigment, particularly as red lead paint for protecting structural steel from rust. *White lead* is lead carbonate, a widely used white pigment for paint. Since the 17th century it has been made by a process originated in Holland, called the Dutch process, wherein metallic lead plates are exposed to carbon dioxide and acetic acid vapors. The soluble salts of lead are lead nitrate and lead acetate or "sugar of lead." *Lead arsenate* is used as an insecticide. *Lead azide* is an explosive which does not, as do most explosives, contain oxygen. It is used in fuze detonators and priming compositions. *Lead tetraethyl* is prepared from a lead-sodium alloy, and is added to some motor fuels to give "anti-knock" qualities. This so-called "ethyl gas" is highly poisonous.

The alloys of lead include solder (tin and lead), pewter (lead, tin, and antimony), type metal (lead, tin, and antimony), Frary metal (lead, calcium, and barium), shot metal (lead and arsenic), one form of Babbitt metal (lead, antimony, tin, and copper). Terne plate is steel

Courtesy Missouri State Chamber of Commerce

LEAD MINE

plate dipped in a lead-tin alloy.

Lead, because it was easily extracted from its ores, was known in early times to the Phoenicians, Greeks, and Romans, who confused it with tin until Pliny differentiated between the two metals. The Romans called it *plumbum*, from which it gets its chemical symbol Pb.

Today, lead is one of the most important industrial metals. It is used in the architectural and construction fields for roofing, for "mattresses" between foundations and bedrock, for pipes, for leading window panes, and as protective shields for radioactive materials. Lead also goes into storage batteries, type metal, bearing metal, electric fuses, cable coverings, lead foil, and novelty manufacturing. Both lead and its compounds are used for military purposes. The compounds of lead are widely employed in the paint industry, in glass manufacturing, in ceramics, in the rubber industry, in the textile field, in medicine, in insecticide manufacture. See also *Uranium*.

Lead, a city of Lawrence County, South Dakota, situated in the Black Hills, about 3 m. s.w. of Deadwood. It is on the Chicago & North Western and the Chicago, Burlington & Quincy R.R.'s. Extensive deposits of gold are worked in the vicinity. The chief buildings include the Hearst Library, the high school, the Recreation Building, the Homestake buildings, and many schools and churches. It has manufactures of utensils, machinery, and jewelry. Lead was settled in 1876 and was incorporated the following year. Population, 1940, 7,520; in 1950, 6,422.

Lead Poisoning (*lĕd pot'zŭn-ĭng*), a disease due to the presence of a considerable amount of lead in the system. Lead poisoning may be acute or chronic. The acute form is infrequent, and symptoms and treatment are the same as those of the corrosive poisonings in general. Chronic lead poisoning (plumbism, or saturnism) is the slow, cumulative poisoning due to daily absorption of small quantities of lead, 1 to 2 milligrams. It may be occupational or accidental. There are over 150 industries in which the workers may be exposed to lead poisoning. Absorption may be from inhalation of fumes or sprays, or by collection of such fumes in the upper nasal passages with subsequent swallowing of mucus. Lead may be carried into the food by soiled hands of painters and other workers. Absorption through the skin may occur in the case of tetra-ethyl-lead or other oil-soluble forms of lead. *Symptoms:* A grayish-blue lead line on the gums just below the junction with the teeth; granular basophilia of the red blood cells, brought out by eosin-methylene-blue staining of fixed specimens; lead or painter's colic, abdominal cramps of varying severity; wrist-drop or ankle-drop from peripheral neuritis in prolonged lead intoxication; in most severe cases, headaches, tremors, convulsions, delirium, and coma may occur. Positive diagnosis may be made by obtaining emission spectrum of lead from the blood of a patient. A few drops of blood are volatilized in a high-temperature carbon arc and the spectrum photographed in a spectrograph of high dispersion. *Treatment:* Remove the patient from the source of poisoning and assist elimination of lead from the patient's system with doses of potassium iodide of 2 to 3 grams daily, in addition to symptomatic treatment. *Prevention:* Installation of adequate hygienic and sanitary measures—fume and dust removal plus masks and shields; thorough scrubbing of hands; showers; changing outer clothing after exposure. See also *Occupational Diseases*.

Leadville (*lĕd'vĭl*), county seat of Lake County, Colorado, near the source of the Arkansas River, 78 m. s.w. of Denver. It is on the Denver & Rio Grande Western and the Colorado & Southern R.R.'s. The Leadville area has produced gold, silver, lead, molybdenum, and zinc. Gold was discovered here in 1860, but the rapid growth of the city began in 1877 when rich silver mines were developed. By 1880 Leadville was the second largest, and probably the most lawless, city in Colorado, with a population of more than 30,000. Among the buildings surviving from the boom days is the Elks (Tabor) Opera House. Population, 1950, 4,081.

Leaf (*lēf*), the organ of a plant that commonly grows from the axis or stem, but sometimes from the root. Leaves are flat, thin, and green in color and constitute the foliage. They never develop into flowers, but exhibit an endless variety of forms in different plants, and constitute marks by which to distinguish easily the different species. A complete leaf consists of a blade or limb,

a leaf stalk or petiole, and a pair of stipules at the base. Many leaves have no stipules, and some have no petiole. In the latter case the leaf is said to be *sessile*. Simple leaves consist of one piece, while compound leaves have more than one piece or blade. The leaves are composed of two kinds of material, woody fiber and cellular tissue, the former being the framework that gives strength to the blade, and the latter being the green pulp of the leaf.

The framework of leaves spreads in various directions and constitutes the ribs, from which branch veins and veinlets, these serving to convey the sap. One side of the leaf is turned upward to the sky and the other toward the ground, each being covered above and below with so-called surfaces or skins. The *stomates* or *pores* are on the lower surface and act as breathing organs to take in essential elements from the air, but the leaves also give out a purified air laden with oxygen, which serves a useful purpose in the maintenance of animal life. Plants of the same species have the same kind of leaves, and these are arranged in an exactly similar way on the stems, being an expansion of the bark and a node of the stem. The arrangement is either *opposite* or *alternate* on the stem, but it is greatly variegated in different species.

Leaf-Hopper (*-hŏp-ẽr*), a small leaping insect which feeds on the juices of plants. Leaf-hoppers, because of their large numbers, do considerable damage.

Leaf Insects (*in'sẽkts*), the name of numerous species of insects remarkable for their resemblance to the leaves of plants on which they feed. The similarity is not only in color, but also in size and in the resemblance of their legs to the ribs and veins of the leaves. Insects of this character are most numerous in tropical countries, occurring in South America, Australia, and portions of Africa. Their main protection against enemies consists in their resemblance to the leaf forms about them, since they are almost incapable of flight. In most species the male has wings and the female is wingless.

Leaf-Miner (*-mīn'ẽr*), member of a family of insects which as larvae burrow into leaves and feed on them.

League (*lēg*), a measure used for estimating length, both upon land and at sea. The nautical league is one-twentieth of a degree, or three equatorial m., or 3.457875 statute m. In England the land league is 3 statute m. The French league has been used for different distances, as the legal post league, equal to 2.42 English m., and the league of 25 to the degree, or 2.76 English m.

League of Nations, a post-World War I international organization for the preservation of peace, first suggested on Jan. 8, 1918, by Woodrow Wilson (*q.v.*), and formulated at the Versailles Peace Conference of 1919. Geneva, Switzerland, was the scene of the first meeting on Nov. 15, 1920, at which 41 nations were represented, and became the permanent headquarters of the League. At one time or another, 63 states have been members of the League. The one-time members which withdrew were Brazil, Chile, Costa Rica, Finland, (Vichy) France, Germany, Guatemala, Honduras, Hungary, Italy, Japan, Nicaragua, Paraguay, Peru, Rumania, Spain, and Venezuela. The only two nations which never became members are the U.S. and Saudi Arabia. The League recognized Austria's enforced *Anschluss* with Germany in 1938, and expelled the Soviet Union for its aggression against Finland in 1939.

Although President Wilson was a member of the committee which drafted the League of

PALACE OF THE LEAGUE OF NATIONS IN GENEVA, SWITZERLAND

Photo by Jaeger, courtesy Swiss Federal Railroad

Nations Covenant, the U.S. Senate refused to ratify it because of Article X, which pledged the signatory powers "to respect and preserve as against external aggression the territorial integrity and existing political independence of all members of the League." The Senate, reflecting isolationist opinion prevalent in the U.S. at that time, felt that such a commitment would result in entangling foreign alliances, and it is maintained that this refusal of the U.S. to support the League weakened it considerably.

The Covenant of the League contained 26 articles. The machinery of the League consisted of the *Assembly*, the *Council* and the *Secretariat*. Before World War II, the *Assembly* met annually each September, and was composed of three representatives for every state, each state having one vote. The *Council* met three times a year to consider political disputes, the preparation of plans for world disarmament and supervision over the administration of the mandates entrusted to certain states. The *Secretariat* consisted of a secretary general and a staff of about 500 with permanent residence in Geneva.

The League was financed by contributions from the member states according to their ability to pay, as determined by the Assembly. The budget of the League never exceeded $10,000,000; the budget for 1943, *e.g.*, including the cost of the World Court and the International Labor Office, was about $2,650,000.

League members were pledged to submit disputes to arbitration. In no case were they to resort to war until three months after the award of the arbitrator. The Permanent Court of International Justice was established at The Hague, Holland, to arbitrate international disputes (see *Arbitration*.)

The Covenant provided that the League was to supervise certain territories taken from Germany and Turkey following World War I. These territories were erected into mandates entrusted to League members. Mandated territories were granted various degrees of independence, based on their stage of development, their geographic situation, and their economic condition.

The League awarded the following mandates over former German colonies: Togoland to France and Great Britain; South West Africa to Union of South Africa; German East Africa to Great Britain and Belgium; German New Guinea to Australia; Nauru Island to New Zealand; the Caroline and Mariana Islands to Japan, and the Samoan Islands to New Zealand. Great Britain exercised a mandate over the former Turkish possession of Iraq until 1927, and continues to hold Palestine as a mandate. The former Turkish dependencies of Syria and Lebanon were mandates of France until declared independent in 1941 following an Allied invasion made in order to prevent German occupation.

The League prevented a number of wars, secured the financial basis of Austria, Hungary, and Greece, improved international traffic and health, curbed the traffic in drugs and women, and reduced child labor. International disputes settled by the League include the following: the Aland Islands dispute between Finland and Sweden; the dispute between Poland and Lithuania over the possession of Wilno; the dispute between Poland and Germany over Upper Silesia; the dispute between Italy, Greece, and Yugoslavia over the boundaries of Albania; the boundary dispute between Czechoslovakia and Hungary; the dispute between Greece and Bulgaria over the Greek invasion of Bulgarian territory, and the Mosul boundary dispute between Iraq and Turkey, involving Great Britain.

The League was unsuccessful in attempts to settle disputes arising out of Japanese aggression against China and the annexation of Ethiopia by Italy. Although France and Russia were sympathetic to Loyalist Spain in the Spanish civil war of 1936-39, the League had little power to intervene. These failures on the part of the League, plus the appeasement policy (*q.v.*) adopted by France and Great Britain toward Germany, helped to precipitate World War II.

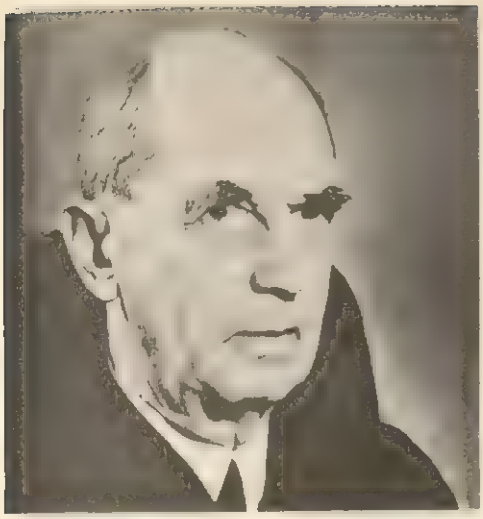
After the outbreak of World War II in 1939, the Assembly and the Council met once. Some departments of the League moved to the U.S., while the others remained in Geneva.

The Permanent Court of International Justice, popularly designated as the World Court, grew out of The Hague Tribunal established in 1899. It was established by the League of Nations under a mandate contained in Article XIV of the League Covenant, and its enabling statute was approved by the League Assembly, Dec. 13, 1920. It was financed through the League.

The International Labor Organization (*q.v.*), created by the Versailles Treaty to improve labor conditions, consisted of both League members and nations such as the U.S. not members of the League.

The final session of the League Assembly took place in Geneva on Apr. 18, 1946. Delegates of 34 member states decided to turn over the League's property value to the newly established United Nations Organization (*q.v.*). The continuation of mandates, however, was upheld until the time when the Trusteeship Council of the U.S., would function. Also terminated was the League's Permanent Court of International Justice, as the United Nations' Court had already convened. See also *United Nations*.

Leahy (*lē'hē*), WILLIAM DANIEL, naval officer, born in Hampton, Iowa, May 6, 1875; died in Bethesda, Md., July 20, 1959. Graduated from the U.S. Naval Acad., Annapolis, Md., as an



WILLIAM D. LEAHY

ensign, in 1899, Leahy attained the rank of admiral, in 1936, after a notable naval career. In 1937 he was appointed chief of naval operations, and upon retirement in 1939 he became governor of Puerto Rico. In 1940 he was named U.S. ambassador to France. In this capacity he maintained unstrained relations with the French government of Marshal Pétain (*q.v.*) until the invasion of North Africa by the Allies was successfully accomplished. In July 1942 he was appointed chief of staff to President F.D. Roosevelt, a position he also assumed under President Truman. In 1950 he published "I Was There," an account of his services during World War II.

Leander (*lē-ăn'dēr*). See *Hero.*

Leap Year (*lēp yēr*), a year to which one day is added, so that it contains 366 days. Every year exactly divisible by four is a leap year, except that only every fourth year ending a century is thus classed. This exception is made to correct the error arising from the addition of one day in four years to the year over the true length of the year. Thus 1800 and 1900 were not leap years, but 1200 and 1600 were and 2000 will be so classified. For a considerable time centuries divisible by 400 will be leap years.

Lear (*lēr*), BEN, army officer, born in Hamilton, Ontario, Canada, May 12, 1879. Having served as a sergeant in the U.S. army during the Spanish-American War. Lear remained in the army, rose through the ranks, and was commissioned a lieutenant general in 1940. From 1940 to 1943 he was commanding general of the Second Army. In 1944 he became commanding general of the Army Ground Forces, and the following year was named deputy commander in the European theater under Gen. Eisenhower. Lear retired from the service in 1945.

Leather (*lĕTH'ēr*), the tanned, tawed, or otherwise dressed skin or hide of an animal. The process of tanning is applied to the skins of different animals for the purpose of making them tough and pliable and to prevent them from putrefying. Some sort of dressing was applied to the skins of animals very early in history, which was but the result of the practice of ancients in using skins for clothing and in the construction of tents, boats, and implements of war. The fact that the Egyptians developed much skill in the production of leather is evident from the remnants found among ruins, many of which appear to date about 1,000 years before the Christian era. That bark is serviceable for tanning was discovered, in all probability, by mere accident, but it has furnished the principal means and is still used quite extensively in many countries. Other processes are by tawing with bichromate of potash, alum, and various mineral salts, and by shamoying or treating the skins with oils.

Commercially *leather* is distinguished from *skin* and *pelt*, the former being the skin of an animal dressed with the hair or fur removed and the latter being untanned skin or hide. Leather is made most commonly from the skins of cattle, though those of swine, horses, asses, sheep, camels, and goats are utilized. When shipped from a long distance, hides reach the tannery in a cured or salted condition, but some, especially in cold seasons, are transported without curing. The first process is to unhair the skins, which is done by means of lime, or by a process of sweating. In the latter case a partial putrefaction takes place and the hairs are removed without injuring the hide. In some tanneries the skins are unhaired in lime solutions to which have been added small percentages of sodium sulfide, arsenic sulfide, sulfhydrates and/or amines such as di-methyl amine. The loosened hairs are removed by scraping, nowadays largely by machinery. The next step is to remove the loose flesh by scraping and brushing, after which the hides are separated according to the class of leather desired. After unhairing, the skins are washed to remove extraneous materials and then they are subjected to an enzyme digestion action termed bating. This is a combination of deliming and enzyme digestion. Chrome tanning is done in drums or paddle vats, where skins are turned several times daily and afterwards are removed to pits containing stronger solutions, until they are placed in the final pit, where they remain for about six weeks. Both varieties of leather are lubricated by being fat-liquored, stuffed or curried, which in all instances is the replacement of natural fats and additional oils or fats as required by the character of the leather in question.

The various varieties (not grades) of leather are finished in different manners. Softness is obtained by "staking," firmness by "rolling,"

LEATHERWORK

Morocco binding stamped with gold, 18th century

polish by "glazing," color by dyes or pigments. Grain effects are obtained by embossing. Patent or enamel leathers are produced by successive coats of oils much like a paint job. This is true of *japanned leather*, which, in the process of manufacture, is stretched on wooden frames, then successive coats of varnish are applied, each of which is allowed to dry and then is rubbed down with pumice stone. *Russian, morocco,* and *seal leather* are other grades of highly finished products, but none of these has any connection with the locality or name applied, except as a recognized grade. The skins of lambs, kids, sheep, and goats are tawed and are used for light shoes and gloves. However, the grade known as *kid* is properly made from goatskins. A waterproof leather known as *cordovan* is obtained from horsehide. Shamoying is applied to chamois skins, being done by oil, but the so-called *shamoy* of the market is largely split leather.

By the electric process hides may be completely tanned in from 40 to 90 hours. The plan is to suspend hides in tanning liquor between two copper plates and apply an electromotive force of 50 volts and a strength of 100 amperes. The time required for the process depends upon the strength of the tan liquor. It has been well established, however, that sole leather cannot be prepared by rapid action for the reason that it requires a slow process to tan thick hides. Many more or less rapid tanning processes have been adopted, but the best results require considerable time.

Leather, ARTIFICIAL, a manufactured material similar in appearance to leather, used extensively in the arts for purposes in which leather was formerly employed, and in other allied industries. This product has come into extensive use since the latter part of the 19th century, when a product known as *leather cloth* began to be manufactured on a large scale in America. The introduction of this article was originally due to the scarcity of leather as compared to the demand. Development of the basic technology, however, has led to the manufacture of many products which have found their uses in applications for which natural leather would not be physically or economically adaptable. These applications include the manufacture of modern furniture, book bindings designed for use in automatic machinery, decorative fabrics, and certain shoe parts. Attempts have been made to produce an artificial leather from leather scraps which are reduced to a pulp and afterward molded into various objects, but these have met with only doubtful success, and have largely been abandoned. The process generally used today consists of the application of a coating which possesses the required characteristics to a paper, cloth, or other suitable backing. Such coatings are made up of combinations of nitrocellulose, rubber, pigments, softeners, and natural and synthetic resins, and lend themselves readily to attractive finishing. The finished product is produced with a high degree of uniformity, and can be cut with less waste than that encountered in processing natural leather. It has achieved an established position among the standard materials available to present day manufacturers.

Leatherback (*lĕTH'ĕr-băk*), the name of a large turtle found in the ocean, so named because the back is incased by a leathery integument instead of a bony shell. Several species have been described, including both oceanic and fresh-water animals. Those found in the Atlantic Ocean range along the coast of the U.S. as far north as New York, and in Europe they extend southward from the English Channel. Some of the specimens have a length of from 6 to 7 ft., the shell being a little more than 4 ft. long. They weigh more than a ton at maturity. Their food consists chiefly of mollusks, fish, and crustaceans.

Leatherneck (*lĕTH'ĕr-nĕk*), slang term for a U.S. marine. The term was derived from the leather stock which was once part of the marine uniform.

Leavenworth (*lĕv'ĕn-wûrth*), county seat of Leavenworth County, Kansas, on the Missouri River, 25 m. N.W. of Kansas City. It is on the Union Pacific, the Chicago Great Western, the

Missouri Pacific, the Atchison, Topeka & Santa Fe, and other railroads. The surrounding agricultural country produces corn, wheat, oats, alfalfa, and tobacco. The manufactures include furniture, batteries, gloves, greeting cards, sash and doors, and milling, foundry, and steel products. Immediately north of the city is the extensive military establishment of Ft. Leavenworth (*q.v.*). The place was settled in 1854 and was incorporated the next year. Population, 1905, 31,857; in 1940, 19,220; in 1950, 20,579.

Leaves of Grass (*lēvz of grăs*), a collection of poems by Walt Whitman (*q.v.*) first published in 1855.

Lebanon (*lĕb'ä-nŭn*), a republic situated in Western Asia, bordered on the N. and E. by Syria, on the S. by Israel, and on the W. by the Mediterranean. It has an area of about 3,600 sq. m. with a population of 1,025,000. Its leading cities are Beirut, Tripoli, Sauda, and Essur.

Lebanon has thick deposits of lignite coal, but its quality is poor. Iron is also mined extensively. The silk and wine industries are the most important; there is little manufacturing. Tobacco, fruits, cereals, and olives are grown, and mulberry trees are raised for the cultivation of silkworms. Beirut, the main seaport, exports silk, fruits, and carpets.

The country has a republican form of government, with a president at the head. The legislative body is a 55-member parliament.

Lebanon appears very early in history as the background to the flourishing Phoenician coastal towns. Under the Thothmosid Pharaohs, Lebanon and Phoenicia were Egyptian protectorates and later passed under the dominance of the Persians and Seleucids. It was only in the 16th century that Lebanon acquired political importance apart from the coastal towns. At that time Monothelite sectaries fled from northern Syria and colonized and Christianized the country. In the 7th century Lebanon appears as the ally of the Roman Emperor Justinian II against the Caliph of Egypt. At that time also began the infiltration of a sect of Islam heretics who finally coalesced into the Druse community and eventually dominated the political life of Lebanon. Latin ecclesiastical and western influence entered the country with the Crusades in the 12th century, but after the collapse of the Frankish Crusade the country relapsed into isolation. Very little is known about the beginnings of political power of the Druses, but in the 15th century Lebanon was ruled by a Druse family, the House of Maan, who continued to dominate the country until they were defeated by the Turks in 1633. During the next two centuries Lebanon engaged in sporadic wars with Turkey, while at the same time the country was almost continuously torn by civil war between rival houses and between the Druses and a Christian sect, the Maronites. French protection of the Maronites increased the tension between the two groups, which culminated in a massacre of the Christians in 1860. As a result, a French army occupied the country and forced the Porte to give Lebanon a Christian governor and some autonomy by means of an Organic Statute (1864). Henceforth, the country experienced a period of peace and prosperity, which ended with the outbreak of World War I. Despite earlier British and French promises of independence, the country was mandated to France in 1920, and between 1920 and 1941 its history is that of Syria (*q.v.*). On Nov. 26, 1941, France declared her intention of making Lebanon a separate republic despite the objections of Syria, and the new republic held its first elections in August 1943. Disagreement with France about retention of French troops in Lebanon led to a discussion before the U.N., and by December 1946 all French troops had been evacuated. In 1948 Lebanon, with other Arab countries, engaged in an unsuccessful war against the newly established state of Israel (*q.v.*). Economically, the country progressed satisfactorily (*e.g.*, the national income rose from an estimated $125 per capita in 1949 to $310 in 1956), but political developments were often disquieting. Political pressure by the United Arab Republic added to the uneasiness accompanying the termination of Western-oriented Pres. Camille Chamoun's term of office (1952-58), and the Lebanese government called for the help of U.S. troops to prevent the outbreak of serious civil strife. Tranquility finally returned to the country with the election of Gen. Fuad Chehab to the presidency (effective Sept. 24, 1958).

LEBANESE PEASANT

Lebanon, county seat of Lebanon County, Pennsylvania, 26 m. E. of Harrisburg. It is on the Pennsylvania and the Philadelphia & Reading R.R.'s, in a valley between the Blue and South

Mts., and is surrounded by a rich coal and iron producing region. Among the chief buildings are the county courthouse and the city hall. The manufactures include textiles, trucks, steel products, machinery, engines, chemicals, silks, shoes, furniture, farming implements, and tobacco products. It was settled by Germans in 1700 and incorporated in 1885. Population, 1950, 28,156.

Lebanon Mountains, the name of two mountain ranges in Lebanon and Syria. They run in almost parallel lines from northeast to southwest and inclose between them the Nahr Litany valley, formerly known as the Coele-Syria valley. The western range, in Lebanon, is called Lebanon and the eastern, in Syria and Lebanon, Anti-Lebanon. The former is known in modern geography as Jebel-Libnan and the latter as Jebel-esh-Shurky. The western range is the more elevated, its highest peak being El-Kazig, which rises 10,020 ft. above sea level. The Anti-Lebanon range is comparatively irregular, its most elevated peak, Jebel-esh-Sheik (Mt. Hermon) being 9,200 ft. above sea level. Snow and ice remain in the higher ravines throughout the year, though the slopes are fertile. The cedar forests are famed in history, but they have been almost entirely removed by careless forestry. A number of streams penetrate the valleys, among them the Jordan River, which has its source in the Lebanon Mts. A class of Christians called Maronites occupy the northern district, and in the southern portion are the Druses (*q.v.*). The principal occupations of these peoples are the culture of silk, the vine, and the mulberry tree, and the rearing of sheep and goats. Large quantities of wheat, rye, barley, millet, and tobacco are cultivated. The most desirable land is possessed by the monks, who maintain Maronite monasteries and have influenced the culture and manners of the region.

Lebbaeus (*lĕb-ē'ŭs*), in the New Testament (Book of Matthew), one of the 12 apostles. St. Mark calls him Thaddaeus and St. Luke refers to him as "Judas, the brother of James."

Lebensraum (*lā'bĕnz-roum*), German expression meaning living space. The term became a favorite of Nazi German officials in justifying German seizure of less powerful nations, claiming that the German people had not ample territory for a bare existence, so that, according to the science of geopolitics (*q.v.*), Germany's frontiers and economically controlled territory had to be extended. See also *Haushofer, Karl.*

Lebrun (*lē-brŭn'*), ALBERT, 14th president of France, born in Lorraine, France, Aug. 29, 1871; died in Paris, March 6, 1950. A civil engineer and high school teacher, he did not enter political life until 1898 when he became president of the city council of his home town. In 1900 he was elected to the Chamber of Deputies. He was later appointed by President Raymond Poincaré (*q.v.*) to head the national debt refunding institution, one of the instruments by which Poincaré restored normal financial conditions in France during 1926. In 1932 he was elected president as a coalition candidate following the assassination of former President Paul Doumer (*q.v.*). Lebrun was re-elected in 1939, and continued as President until France was over-run by the Germans in World War II. He retired from office in 1940, after Marshal Pétain had established an authoritarian government in France.

Lebrun, CHARLES, historical painter, born in Paris, France, Feb. 24, 1619; died Feb. 12, 1690. He belonged to the classical school of France, of which he was a distinguished representative. His most noted work was "Mary Washing the Feet of the Savior in the House of Simon the Pharisee."

Lebrun, MARIE ANNE ELIZABETH VIGÉE-, painter, born in Paris, France, April 16, 1755; died there March 30, 1842. In addition to her many self-portraits, either alone or with her daughter, she created portraits of Marie Antoinette, George IV of England, Lord Byron, Caroline Murat, Lady Hamilton, and Napoleon's sister. Several of her best pictures are now at the Louvre in Paris.

Lech (*lĕk*), a river of Germany and Austria. It joins the Danube at Donauwörth after a course of 175 m. The Lech is a rapid stream, falling 4,600 ft. in its course. It is historically significant because of the battles in which Tilly defended the passage of this stream against Gustavus Adolphus.

Lecky (*lĕk'ĭ*), WILLIAM EDWARD HARTPOLE, philosopher and historian, born near Dublin, Ireland, March 26, 1838; died in London, Oct. 23, 1903. He was graduated from Trinity Coll., Dublin, in 1859, and two years later published "Leaders of Public Opinion in Ireland." He soon began to devote himself to historical research. For a number of years he represented the Univ. of Dublin in Parliament, where, in 1886, he opposed the Gladstone Home Rule policy for Ireland. His chief work was "The History of England in the 18th Century," a valuable reference book.

Leclaire (*lę-klâr'*), EDMÉ-JEAN, political economist, born at Aisy-sur-Armançon, France, May 14, 1801; died in Herblay, France, Aug. 10, 1872. His early education was limited. He worked on a farm until he was 17, learned the trade of a mason, and later went to Paris as a house painter. By industry he acquired a profitable business, employing a large number of workmen, and after carefully studying economic questions adopted the cooperative system of labor. The success attending his enterprises attracted wide attention, and it may be said that much of the credit for the profit-sharing system as applied to various industries in many manufacturing countries is due to Leclaire.

Lecompton Constitution (*lê-kŏmp'tŭn kŏn'-*

stī-tū'shŭn), the name of a constitution adopted by the proslavery party of Kansas in a convention held at Lecompton on Sept. 5, 1857. It declared the legality of slavery in Kansas and prohibited the passage of emancipation laws by the legislature. The entire constitution was not submitted to the people of the territory, who were to vote only for the constitution with or without slavery. In the election the free-state settlers abstained from voting, so that the result was a large majority in favor of the proslavery party. Later the territorial legislature ordered a vote on the constitution as a whole. It was then voted down by a large majority, and in 1859 an antislavery constitution was adopted.

Le Conte (*lē kŏnt'*), JOHN, physicist, son of Louis Le Conte, born in Liberty County, Ga., Dec. 4, 1818; died in Berkeley, Calif., April 29, 1891. After being graduated from Franklin Coll., he studied medicine in New York. Subsequently he became professor at Franklin Coll. and later at the Univ. of California, where he also served as president (1875-81). He wrote *ca.* 100 papers on scientific subjects, including "The Physics of Meteorology" and "Sound-Shadows in Water."

Le Conte, JOSEPH, geologist, son of Louis Le Conte, born in Liberty County, Ga., Feb. 26, 1823; died near Yosemite Valley, July 6, 1901. He was graduated from Franklin Coll., received a degree in medicine at the Coll. of Physicians and Surgeons in New York, and in 1851 accompanied Louis Agassiz (*q.v.*) on his exploring expedition to Florida. He became professor of natural sciences in Oglethorpe Coll. in 1852, taught chemistry and geology in South Carolina Coll., and subsequently became professor of natural history and geology in the Univ. of California. He published papers on scientific subjects and a "Journal of Ramblings Through the High Sierra."

Le Conte, LOUIS, naturalist and traveler, born near Shrewsbury, N.J., Aug. 4, 1782; died in Georgia, Jan. 9, 1838. He studied at Columbia Coll., took a course in medicine, and, after settling in Georgia, became especially interested in botany.

Leconte de Lisle (*lę-kŏnt' dę lēl'*), CHARLES MARIE, French poet, born on the island of Réunion, in the Indian Ocean, Oct. 23, 1818; died in Louveciennes, France, July 17, 1894. He received a liberal education and settled in Paris as a writer. Besides winning gradual recognition for his own poetry, he made numerous translations from the Oriental and Greek languages. His translations include the "Iliad," the "Odyssey," and the works of Aeschylus, Horace, Sophocles, Theocritus, Hesiod, and Euripides. He was noted for his ability to touch his readers with simple and natural things, and is still widely admired for this quality.

Le Corbusier (*lē kôr'būs-yā*), pseudonym of CHARLES ÉDOUARD JEANNERET, architect, painter,

LE CORBUSIER

and writer, born near Neuchâtel, Switzerland, 1887. He worked with the well-known architects Peter Behrens in Berlin and Josef Hofmann in Vienna, before going to Paris (1916) where he became highly esteemed for his modern functional architecture, his pioneer work with ferroconcrete designs, and his sound city-planning and housing projects. In cooperation with his cousin Pierre Jeanneret he founded the periodical *L'Esprit Nouveau* which became the mouthpiece of the "modernists." The school of purism in art, advocating the "machine for living," originated with him and Amédée Ozenfant (the latter residing in the U.S.), with whom he wrote *"Après le Cubisme"* (1918) and *"La Peinture Moderne"* (1918). Others of his writings, such as "Towards a New Architecture," *"La Ville Radieuse,"* "The City of Tomorrow," and "When the Cathedrals Were White," give proof of Le Corbusier's far-seeing originality of architectural design. He has gained recognition as a leading figure in 20th-century architecture. The designer of the Palace of the League of Nations in Geneva, Switzerland, Le Corbusier represented France (1946) on the U.N. Headquarters Commission, and was named (1947) to the board of design consultants entrusted with planning the permanent U.N. site in New York City.

Le Creusot (*lę krû-zō'*), a city of central France in the department of Saône-et-Loire, situated about 45 m. s.w. of Dijon. It is the site of one of the largest iron and steel works in the world. Le Creusot was founded in 1781, and because of its importance as an armament center, it has become a primary target during wartime. Pop., 1950, 28,471.

Leda (*lē'dä*), in Greek mythology, mother of Helen of Troy. Leda was beloved by Zeus, who visited her in the guise of a swan. Leda and the swan are frequently represented in art, particularly in paintings of the Renaissance.

Ledo (*lē'dō*), a town in northeastern India, in the state of Assam, *ca.* 35 m. s. of Sadiya.

During World War II, Ledo was the starting point of the Ledo Road. Built by natives under U.S. military supervision (1942-44), the road re-established land communications with China, broken when the Japanese won control of the Burma Road. The 478-m. road connected with the Burma Road at Bhamo, in northern Burma. The entire route from Ledo to Kunming, China, was later named the Stilwell Road, after Gen. Joseph Stilwell (*q.v.*). Because of Allied success in flying supplies over the Himalayas, the road decreased in importance, and was declared surplus property by the U.S. in 1945.

Ledyard (*lĕd'yērd*), JOHN, explorer, born in Groton, Conn., in 1751; died in Cairo, Egypt, Jan. 10, 1789. After studying law, he became a divinity student at Dartmouth Coll. but left abruptly to ship as a sailor to Gibraltar. There he deserted to enlist in the British army. Forced to rejoin his ship, he was returned to America. He later went to England to join the third expedition of discovery organized by Capt. James Cook (*q.v.*). Lee was a corporal of marines in this expedition and kept a complete diary of the voyage, which he published at Hartford, Conn., in 1783. In 1784, he proposed a trip to explore the northwest coast of America, but was unable to finance the expedition. He decided to attempt the trip from Europe, and went as far as St. Petersburg, but was again unsuccessful. In 1788 he returned to Europe. A later tour of northern Africa led to his death in Egypt.

Lee (*lē*), ANN, founder of the Shakers in America, born in Manchester, England, Feb. 29, 1736; died at Watervliet, N.Y., Sept. 8, 1784. She became a member of a group known as the Shaking Quakers in 1758. She began to preach in the streets of Manchester, becoming known as "Mother Ann," and was acknowledged leader of the group in 1770. Her doctrines included those of celibacy, the second coming of Christ in the form of a woman, and the possibility of constant communication between human beings and the world of spirits. Her followers suffered from mob violence, and she was imprisoned. After her release she emigrated to America (1774), claiming that she had been instructed to do so in a vision. With eight of her disciples, she sailed for New York. They first went to Albany, but later the society settled in Watervliet, where, after a tour of New England (1781-83), she died in September 1784. See also *Shakers*.

Lee, ARTHUR, diplomat, born at Stratford, Va., Dec. 21, 1740; died Dec. 12, 1792. After a medical education in England and Scotland, and a brief period of practice at Williamsburg, Va., he went to England in 1768 to study law. He was admitted to the bar in 1775. Lee published a number of pamphlets and articles to aid the colonies in their struggle against the British, including "An Appeal to the Justice and Interests of the People of Great Britain" (1774). Appointed (1775) to act as agent of a committee of secret correspondence with friends of the colonies, he went to Paris in 1776 to aid Benjamin Franklin and Silas Deane (*qq.v.*) in securing a treaty of alliance with France. Later he was a commissioner to Spain and Germany. In 1780 he was recalled to America after a conflict with Deane which had resulted in the latter's recall in 1777. Lee was elected to the Virginia legislature in 1781, served as a member of Congress until 1784, and as a commissioner to treat with the Indians (1784-85). While in Congress, he opposed the adoption of the Constitution.

Lee, CHARLES, soldier, born in Dernhall, England, in 1731; died in Philadelphia, Pa., Oct. 2, 1782. Educated in Europe, Lee was an ensign in the company of his father, Col. John Lee (1747), and in 1751 received a lieutenant's commission. He joined Gen. Braddock's staff in America. After Braddock's defeat he became a captain of grenadiers, and in 1760 returned to Europe. He served in Portugal under Burgoyne and on the Polish staff in 1769. In 1773 he returned to America, was appointed major general by the colonists, and resigned his British pension. He took part at the siege of Boston, began the fortifications of New York, and in 1776 was in charge of defenses in South Carolina and Georgia. In the autumn of that year he disregarded Washington's order to join the main army and was captured by the British in New Jersey. At first treated as a deserter by his British captors, he was later considered a prisoner of war.

CHARLES LEE

In 1858 a document was found by which it became conclusive that Lee had intrigued against Washington with the Howes. In May 1778, he was exchanged for Gen. Prescott, after which he was placed in command at Monmouth, and on account of disobedience and disrespect was court-martialed and suspended for a year. Later he wrote a disrespectful note to the president of Congress, because of which his commission was revoked, and he died in obscurity. In 1792 Edward Langworthy published the essays and papers left by him under the title "Memoirs of the Late Charles Lee."

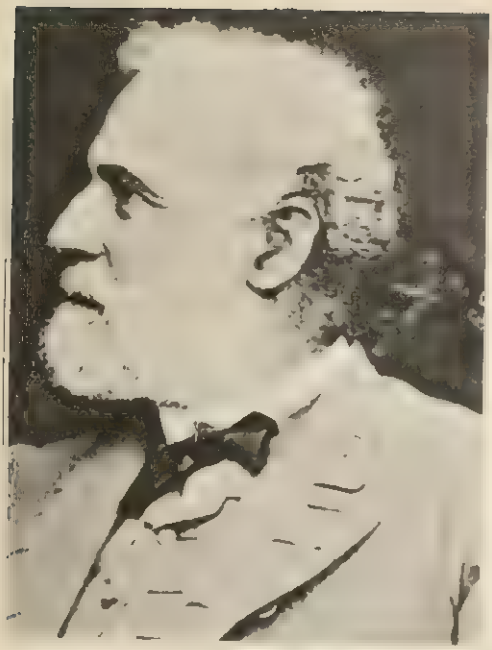
Lee, FITZHUGH, general, nephew of Robert E. Lee, born in Clermont, Va., Nov. 19, 1835; died Apr. 28, 1905. He was graduated from West Point, served against the Indians, and in 1860 became instructor of cavalry at West Point. The next year he joined the Confederate Army and rose to the rank of major general. He was wounded at the Battle of Winchester, where three horses were shot from under him, and took part in the Virginia campaigns. In 1865 he surrendered to Gen. Meade at Farmville. He was elected governor of Virginia as a Democrat in 1886, serving four years in that office, and in 1895 was appointed U.S. consul general at Havana by President Cleveland. He discharged the duties of this position with much efficiency, especially during the trying period preceding the Spanish-American War. In 1898 he became major general of volunteers, and before the close of the year was appointed governor general of the province of Havana by President McKinley. He won high repute as a military leader and diplomat.

Lee, FRANCIS LIGHTFOOT, statesman, born at Stratford, Va., Oct. 14, 1734; died Apr. 3, 1797. He was a son of Thomas Lee and a brother of Arthur Lee (*q.v.*). In 1765 he was elected a member of the House of Burgesses and for four years was a delegate in the Continental Congress, and became a signer of the Declaration of Independence. Later he took part in framing the Articles of Confederation, and throughout the Revolution was a friend and supporter of Washington. In 1779 he retired to private life.

Lee, HENRY, soldier, born in Stratford, Va., Jan. 29, 1756; died in Cumberland Island, Georgia, Mar. 25, 1818. He studied at Princeton Coll. and was appointed captain of cavalry in 1776. Two years later he was made major of an independent corps and became known as "Light Horse Harry." His facility and accuracy of movement attracted the favorable attention of Washington, and in 1779 Congress awarded him a gold medal for capturing Paulus Hook. Lee was sent to assist Greene in the capture of Augusta, took part in the Battles of Guilford Courthouse and Eutaw Springs, and in 1786 became a member of Congress from Virginia. In 1792 he was chosen governor of Virginia. He commanded the force sent by Washington for the suppression of the Whisky Insurrection in Western Pennsylvania. In 1799, selected by Congress to eulogize the first President, he designated Washington as "First in war, first in peace, and first in the hearts of his countrymen." While at Baltimore, in 1814, a mob destroyed the office of the *Federal Republican* and, in seeking to counteract the destructive forces, Lee was seriously injured, from the effects of which he died four years later. He was the father of Gen. Robert E. Lee. His "Memoirs of the Wars of the Southern Department of the U.S." is noteworthy.

Lee, JOHN CLIFFORD HODGES, army officer, born in Junction City, Kans., Aug. 1, 1887; died in York, Pa., Aug. 30, 1958. Educated at West Point, he was graduated in 1909 and appointed a second lieutenant. By 1940 he had risen to the rank of brigadier general, and when the U.S. entered World War II he was made commander of the 2nd Infantry Division at Ft. Sam Houston, Texas. Promoted to major general in 1942, he was assigned to the European Theater of Operations as chief of U.S. supply services and was deputy commander to Gen. Eisenhower. He became a lieutenant general, 1944, a major general, 1945, and was in charge of troops in the Mediterranean area, 1946-47. A disability caused his retirement from the Army as a lieutenant general in 1947, when he became general secretary of the Protestant Episcopal Brotherhood of St. Andrew, in York, Pa.

Lee, RICHARD HENRY, statesman and orator, born in Westmoreland County, Virginia, Jan. 20, 1732; died at Chantilly, Va., June 19, 1794. He studied in Virginia and England and, after spending some time in travel, settled in Virginia in 1752, where he came into possession of an estate left by his father. In 1757 he was elected as a delegate to the House of Burgesses, where he opposed slavery and proposed a scheme to discourage slave importation by levying high taxes. He was made collector under the Stamp Act in 1764, but soon after aroused public sentiment against this system of taxation by the British. Lee originated the idea of a colonial congress, advocating it as a protective means against the English policy. Accordingly, the first Continental Congress assembled in Philadelphia in 1774, of which he became a recognized leader. Besides delivering a number of able addresses in this body, he prepared an address to Great Britain as directed by Congress in 1775. In accordance with instructions from the Virginia House of Burgesses, he introduced resolutions on June 7, 1776, which declared "that these united colonies are, and of right out to be, free and independent states, and that they are absolved from all allegiance to the British crown, and that all political connection between them and the state



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ROBERT E. LEE

of Great Britain is, and ought to be, totally dissolved." He was a member of the Congress authorized by the Articles of Confederation, and as such opposed the adoption of the Constitution on the ground that it interfered with the power of the states, but accepted the office of Senator with the view of securing amendments. Later his prejudice against the Constitution was largely removed, and in all of his legislative activities he gave warm support to Washington. He retired from public service in 1792 with the good wishes and high esteem of his countrymen.

Lee, ROBERT EDWARD, general, son of "Light Horse Harry," born in Stratford, Va., Jan. 19, 1807; died in Lexington, Va., Oct. 12, 1870. He entered the U.S. Military Acad. at West Point at the age of 18 and was graduated with high standing in 1829. He married Mary Custis, daughter of G.W.P. Custis, the adopted son of George Washington, in 1832, and by the marriage came into possession of valuable estates on the Potomac and Pamunkey Rivers. Subsequently he went on an extended tour of Europe. He was promoted to the rank of captain in 1838, and at the beginning of the Mexican War became chief engineer of the American army invading Mexico. Lee served wtih distinction at Cerro Gordo, Contreras, Cherubusco, and Chapultepec; he received a severe wound in the last-named battle, and soon after was promoted to the rank of colonel. He superintended military studies at West Point in 1852-55, and remained in the service of the Union until Apr. 17, 1861, when Virginia seceded and he became a general in the Confederate Army. He operated in Virginia and South Carolina for a year as a subordinate general, but was made supreme in command on May 31, 1862, after J.E. Johnston had been wounded at Fair Oaks.

The history of Lee so far as it relates to the Civil War is that of the Army of Northern Virginia. In the Seven Days' Battles he displayed extraordinary military tact, beat Pope at the second Battle of Bull Run, and immediately began his first invasion of the North, in the Fall of 1862. The first invasion ended on Sept. 17, at the drawn Battle of Antietam, and Lee crossed the Potomac into Maryland for the purpose of threatening Washington; in moving up the Shenandoah valley into that of the Rappahannock he was intercepted by Burnside at Fredericksburg, where the latter was defeated. Lee likewise won a decided success over Hooker on May 2-4, 1863, at the Battle of Chancellorsville. He now resolved to invade Pennsylvania with all his available forces, but was met by Meade at Gettysburg, July 1-3, 1863, and was defeated, after which he recrossed the Potomac and fell back safely into Virginia.

In the spring of 1864 Gen. Grant took the field against Lee. The first engagement between the two generals occurred at the Wilderness in May, and this was followed in rapid succession by the Battles of Spottsylvania and Cold Harbor. These engagements were followed by continued maneuvers and confronts, but Lee gradually fell back to Petersburg and Richmond, after which the long sieges of those points began. By a desperate effort Gen. Grant broke through the Confederate defenses on Apr. 2, 1865, and Lee's army was compelled to evacuate Richmond. Soon after he made an attempt to join Johnston, but Grant's army, being larger, gradually hemmed the Confederate forces in close quarters. This resulted in the surrender at Appomattox, Apr. 9, when the Civil War ended. In October 1865, Lee became president of Washington Coll., now Washington and Lee Univ., which position he held until his death. Gen. Lee was an able military commander, a man of noble character, and much revered and beloved. He edited "Memoirs of the Wars of the Southern Department of the U.S.," written by his father, Henry Lee.

Lee, SIR SIDNEY, editor and scholar, born in London, England, in 1859; died in 1926. In 1883, Lee became associated with "The [English] Dictionary of National Biography," and for 34 years he devoted himself to compiling that great reference work, first as assistant editor (1883-90), as co-editor with Sir Leslie Stephen (1890-91), and finally as editor-in-chief (1891-1917). He supervised work on the last 37 volumes and the two supplements and was the author of about 800 of the articles in those volumes. In recognition of his work he was knighted in 1911. He also published a life of King Edward VII, which King George V

specially commissioned him to write; a scholarly biography of Shakespeare (1900); a life of Queen Victoria (1904); and other biographical works.

Leech (*lēch*), a class of suctorial worms found in bodies of water, marshes, and other moist places. Most of the many species inhabit sloughs and ponds of fresh water, but they are also found in marine waters. The group includes the common horse leeches, medicinal leeches, green leeches, and a number of other species. The body is composed of from 80 to 100 rings. Most species have a mouth furnished with toothed plates with which they make an incision for sucking blood from animals, and many are parasitic on crustaceans and fishes. In Ceylon the land leeches live among damp foliage and are a common pest, attaching themselves to man and beast. In colder climates the leeches hibernate during the winter by burying themselves in the mud at the bottom of pools and in marshy lands. The medicinal leeches formerly were used extensively for local extraction of blood in cases where the depletion of venous blood was thought advisable. These leeches are from 2 to 4 in. long, have a stomach with elongated pouches, and are capable of holding several times their weight in blood. When the stomach is filled, the leech has sufficient nutritious food for about a year, but may be made to disgorge the contents of the stomach by sprinkling salt on its body, when it is again ready for service. At present leeches are used only to a limited extent. They are employed principally in the southern part of Europe and the western part of Asia.

Leech, JOHN, artist and humorist, born in London, England, Aug. 29, 1817; died in Kensington, Oct. 29, 1864. He took lessons in sketching from his father, studied with Thackeray at Charter House, and began to publish designs at 18. His first works were published as etchings and sketches by A. Pen, Esq., and consisted chiefly of representations of comic characters seen on the streets of London. His reputation rests largely upon the excellent drawings and sketches that appeared in *Punch,* illustrating incidents of political life, fashions, popular follies, scientific tendencies, public gossip, and humorous incidents. He furnished illustrations for Dickens's "Christmas Carol" and various other publications.

Leech Lake, a lake in Cass County, Minnesota. It is near the source of the Mississippi River, into which it discharges by a short outlet. The length is 20 m. and the breadth is 15 m. It is 1,296 ft. above sea level.

Leeds (*lēdz*), a city of Yorkshire, England, on the Aire River, 20 m. s.w. of York. It is at the junction of several important railroads. Communication is furnished toward the west by the Leeds & Liverpool Canal, which was opened in 1816. The river is navigable to Leeds and adds materially to the transportation facilities. Among the noteworthy buildings are the Church of St. Peter, Leeds Univ., the city hall, the Leeds Infirmary, the public library, the royal exchange, and many schools and churches. About 3 m. distant are the remains of Kirkstall Abbey. It is noted for its manufactures of woolen goods, steel and iron products, boots and shoes, machinery, clothing, glass, cotton prints, earthenware, and tobacco products. In the vicinity are rich deposits of iron ore. The surrounding country produces large quantities of cereals, fruits, and vegetables. Leeds dates from the time of the Saxons, when it was an important place, and was incorporated in 1208. Population, *ca.* 450,000.

Leek (*lēk*), a biennial plant (*Allium porum*) native to southern Europe. It is related to the onion, but where the onion has a bulb the leek has a thickening at the base of the stem. The stem ranges from 10 in. to 3 ft. in height and is generally blanched for eating purposes by mounding earth about it. The leaves are about an inch wide, somewhat thick and fleshy, and grow in clusters near the surface. Milder in flavor than the onion, the leek is used in flavoring soups and other dishes or is served as a vegetable in the same style as asparagus. It is the Welsh floral emblem; as such, the leaves are displayed on hats on St. David's Day.

Leeuwenhoeck (*lā'vẹn-hōōk*), or LEUWENHOEK, ANTONIUS VAN, anatomist and microscopist, born in Delft, Holland, Oct. 24, 1632; died there Aug. 26, 1723. Although he had no formal scientific education, his natural talents led him to forsake his position in a merchant's office for pure scientific investigation. He began experimenting with ground lenses and soon discovered that single lenses were superior to the double lenses then being used in ordinary microscopes—a discovery that caused him to be termed "the father of scientific microscopy." While spending his entire life as a professional lens manufacturer, Leeuwenhoeck devoted much of his time to anatomical study. Although his researches followed no definite scientific plan, his powers of careful observation enabled him to make many discoveries in the minute anatomy of man, higher animals, and insects. Among these were his confirmation of the theory concerning capillary circulation of the blood, his discovery of the red corpuscles, and his discoveries concerning the fibrous structure of the crystalline lens, the nature of the brain, nerves, hair, and the epidermis.

Leeward Islands (*lē'wērd*), a group of islands in the Lesser Antilles, situated N. of the Windward Islands and S.E. of Puerto Rico. Within this group are four British colonies totaling 422.5 sq. m. in area. The colony of Antigua includes the islands of Antigua, Redonda, and Barbuda; the capital is St. Johns, Antigua. The

British Virgin Islands colony consists of 36 small islands, 11 of them inhabited; the capital is Road Town, on Tortola, the largest island. The colony of St. Christopher-Nevis-Anguilla is composed of those islands plus Sombrero. The capital of St. Christopher (usually called St. Kitts) is Basseterre; of Nevis, Charlestown. The colony of Montserrat is a single island, with its capital at Plymouth. Four-fifths of the population are Negroes; the others, whites or mulattoes. Basseterre and St. Johns are busy ports with good harbors. The islands produce sugar and molasses, cotton, livestock, fruits (particularly limes), charcoal, salt, and vegetables. The colonies, with those of the Windward Islands (*q.v.*), in 1960 received ministerial government with an administrator appointed by the crown. The first British settlement was at St. Kitts in 1625. In 1940 sites for bases near Parham, Antigua, were leased to the U.S. for 99 years. In 1956 Antigua, St. Kitts-Nevis-Anguilla, and Montserrat became founding members of the British Caribbean Federation, which subsequently—from 1958 to 1962—formed the West Indies Federation. Population, 1958 (est.), 137,420.

The non-British islands of the Leeward group comprise the French island of Guadeloupe (and its dependencies Marie Galante, Les Saintes, Désirade, St. Barthélemy, and part of St. Martin (the other part being Dutch); the Virgin Islands of the U.S.; and the Netherlands Antilles, also called the Dutch West Indies (including Saba, St. Eustatius, and part of St. Martin, or St. Maarten). The Leewards were discovered by Columbus in 1493.

Lefebvre (*lē.fē'vr'*), FRANÇOIS JOSEPH, French soldier, born in Ruffach, in Alsace, Oct. 25, 1755; died in Paris, Sept. 14, 1820. In 1773 he joined the French army, rose to the rank of brigadier general, and was made a marshal by Napoleon at the establishment of the first Empire. He was given the title of duke of Danzig in 1807 for his support of Napoleon during the siege of Danzig. In the Peninsular War he captured Bilbao, defeated the British in Spain in 1808, and took part with Napoleon in the Russian invasion. In 1814 he was in command of the left wing of Napoleon's army, resisting the advance of the allies, but when the Bourbons were restored he surrendered and was made a French peer.

Lefebvre, JULES JOSEPH, painter, born in Tournan, France, March 14, 1836; died Feb. 24, 1912(?). He was a pupil of Léon Coignet. In 1851 he won the Prix de Rome with his "Death of Priam." In 1878 he was awarded a medal at the Universal Exposition in Paris, and was made a member of the Acad. of Fine Arts in 1891. Most of his works are portraits.

Leg (*lĕg*), a limb or member of an animal, forming the lower extremity, used for support and locomotion. The larger animals, with two or four legs, are called, respectively, bipeds and quadrupeds. The portion of the human leg from the hip to the knee is known as the thigh—which has one bone—and the part below the knee is the leg proper. The thigh bone, called the *femur*, is the largest and strongest bone of the body. At the hip it articulates with the hip bone by a ball-and-socket joint, at the knee, with a hinge joint. The two bones below the knee, the *tibia* (the larger) and the *fibula*, are connected at the knee and the ankle; the tibia is connected with the femur behind the kneecap (patella). The calf of the leg is a muscular mass on the back of the human leg, below the knee; it is essential in moving and standing in an erect attitude.

Legacy (*lĕg'g-sē*), a gift of personal property or money conveyed by will and differing from a devise, which is understood to be a gift of real property. In the U.S., a legacy may be unconditional or may be subject to some uncertain event or condition. The laws of the different states are somewhat varied, but in most instances the testator may bequeath in general or specific terms. He may name an executor and make bequests in favor of relatives, friends, or charitable and public institutions. In most countries, a limited amount of property may be willed orally in the presence of witnesses, but when the legacy exceeds the common limit in value a written instrument is required. Creditors have a prior claim to legatees.

Le Gallienne (*lē găl'lĭ-ĕn*), EVA, actress, born in London, England, Jan. 11, 1899, daughter of Richard Le Gallienne (*q.v.*). After receiving her education in France, she made her stage debut in London at the age of 16. A year later she appeared on the New York stage and scored great popular success. She performed chiefly before American audiences and in 1945 was given the American Acad. of Arts and Letters Award for her service to the theater. She was the founder of the Civic Repertory Theater (1926) and one of the founders of the American Repertory Theater (1946), both in New York City. Among plays in which she has taken leading roles are "Jeanne d'Arc" (1925), "Peter Pan" (1928), "*L'Aiglon*" (1934), "Uncle Harry" (1942-43), "The Southwest Corner" (1955), and "Mary Stuart" (1957). She toured in "The Corn Is Green" (1949-50) and appeared on TV in "The Bridge of San Luis Rey" (1958). She is the author of "At 33" (1934) and "With A Quiet Heart" (1953).

Le Gallienne, RICHARD, author, born in Liverpool, England, Jan. 20, 1866; died in Menton, France, Sept. 14, 1947. He was educated at Liverpool Coll. and took up a business career, but after six years he turned to literary pursuits. For some time he was literary critic of the Liverpool *Star* and subsequently joined the staff of the *Daily Chronicle*. In 1899 he published criticisms on the art and

style of Rudyard Kipling. About the same time he made a lecture tour of Canada and the U.S., and afterward took up his residence in New York City. He was living in France at the time of the German occupation of that country during World War II. His books include: "The Religion of a Literary Man," "Travels in England," "English Poems," "Retrospective Views," "An Old Country House," "The Romantic '90's," and "From a Paris Scrapbook"; and he edited "The Le Gallienne Book of English Verse."

Legal Tender, the act of tendering payment at the time and place in full settlement of a claim, using such currency, or money, as the law authorizes a debtor to tender and requires a creditor to receive. The effect of a tender of payment does not discharge the debtor, but it saves the tenderer from paying interest thereafter and from the costs of a suit for the debt, but the exact amount due must be offered. It is not sufficient to offer to pay, but the money must be actually produced and made acceptable to the creditor. The provisions that regulate a legal tender differ materially in different countries. In Great Britain, small denominations are not legal tender for sums above a fixed amount. Since 1933, all U.S. coins and currencies, including Federal Reserve notes and circulating notes of Federal Reserve banks and national banking associations, have been legal tender for all debts, public and private.

EVA LE GALLIENNE

Photo by A. Valente, N. Y.

Legend (*lĕj'ĕnd*), a term formerly applied to certain writings that were designed as lessons in the religious service of the Christian church. These writings contain biographies of saints and martyrs and stories of remarkable religious enterprises. They are intermingled with many valuable precepts, encouraging moral conduct and right living. The monastic institutions were prolific centers for the accumulation of these writings, at which it was not uncommon to read the histories of saints and martyrs on the particular days set apart for them. Most of these writings originated in the 12th century and spread alike among the Eastern and Western churches, serving the useful purpose of suppressing many of the writings of heathen origin. At present the term legend is understood to imply a narrative, usually entertaining, based on tradition with some intermixture of fact. They sprang up naturally among the different peoples and embody popular feeling in characteristic narrations.

Legendre (*lę-zhän'dr'*), ADRIEN MARIE, mathematician, born in Toulouse, France, in 1752; died in Paris, Jan. 10, 1833. He studied at the Collège Mazarin in Paris, became professor of mathematics in the military schools, and was honored by election to the Acad. of Sciences in 1783. In 1787 he became a member of the Royal Society of London. He was employed in the latter year together with Méchain and Cassini to measure a degree of latitude between Dunkirk and Boulogne, while Gen. Roy measured on the English side of the Channel, this being done to connect Paris and Greenwich. Subsequently Legendre took a leading part in introducing the decimal system into France. In 1816 he was appointed examiner of Polytechnic School candidates. He wrote widely in his field.

Léger (*lā-zhā*), FERNAND, artist, born in Argentan, France, Feb. 4, 1881; died at Gif-sur-Yvette, near Paris, Aug. 17, 1955. He began as a draftsman and retoucher of photographs. He later studied art in Paris and was associated with the cubists, 1910-14. During World War I he designed breech mechanisms for guns, and this same mechanical tendency is evident in his painting. His technique has been called "mechanical dynamism," and his canvases are characterized by static design and mathematical composition. His film *"Ballet mécanique"* was a forerunner of later animated film cartoons. Many of his later works were murals. In 1940 he came to New York, where he lived and worked until France was liberated from the Germans. See also *Abstract Art.*

Leghorn (*lĕg'hôrn*), or LIVORNO, a seaport on the Mediterranean, in the province of Tuscany, Italy, 12 m. s.w. of Pisa. It has a safe and com-

modious harbor, important railroad connections, and modern municipal facilities. It has manufactures of ships, machinery, clothing, hats, cheese, tobacco, salt, spirituous liquors, cotton and woolen goods, and oil. Its importance dates from the 16th century. A naval base, it figured in World War II, during the Italian campaign, when it was captured by U.S. forces in July 1944. Population, *ca.* 125,000.

Legion (*lē'jŭn*), a division of the army of ancient Rome, constituting at different times a body of men numbering from 2,000 to 6,000. When first organized, the legion comprised 15 companies, each company containing 60 rank and file, two officers or centurions, and a standard bearer. Subsequently it was divided into 10 cohorts, each cohort into three companies, and each company into two centuries. Romulus established the legion that contained 3,000 foot soldiers. At the time of the Second Punic War the legion numbered from 4,200 to 5,200, and from the year 100 B.C. to the downfall of the empire the number varied from 1,000 to 6,200. An eagle was the standard of the legion.

Legion, THE AMERICAN, a patriotic and nonpolitical organization founded in Paris, France, Mar. 15 to 17, 1919, by veterans of World War I, and since Oct. 29, 1942, including veterans of World War II. It has now grown to be the largest veterans' organization in the world with more than 3,000,000 members in 14,500 posts. World War II veterans now constitute about 60 per cent of the membership.

The purposes for which the legion was founded as expressed in the preamble to its constitution are: "To uphold and defend the Constitution of the U.S.; to maintain law and order; to foster and perpetuate a 100 per cent Americanism; to preserve the memories and incidents of our associations in the World Wars; to inculcate a sense of individual obligation to the community, state, and nation; to combat the autocracy of both the classes and the masses; to make right the master of might; to promote peace and good will on earth; to safeguard and transmit to posterity the principles of justice, freedom, and democracy; and to consecrate and sanctify our comradeship by our devotion to mutual helpfulness."

AMERICAN LEGION HEADQUARTERS

The American Legion has been instrumental in securing legislation favorable to veterans as well as legislation to strengthen national defense, promote Americanism, and improve the welfare of children. It has championed many laws providing for adequate care of disabled veterans, war widows and orphans, including legislation creating the original Veterans' Bureau (now the Veterans Administration), the passage of the G.I. Bill of Rights for World War II veterans, and the payment of adjusted service compensation to World War I veterans. Legionnaires carry on nation-wide youth-training programs in the interest of better future citizenship, such as junior baseball, Boys' State, the national high school oratorical contests, school medal awards, and sponsorship of more than 3,000 Boy Scout troops. The American Legion originated the annual observance of American Education Week in 1920 and has been a strong supporter of education.

Affiliated with the American Legion are its Auxiliary; the Sons of The American Legion; the Forty and Eight, fun and honor group of the American Legion; and the Eight and Forty, the fun and honor body of the Auxiliary.

The American Legion's national organs are *The American Legion Magazine* and *The National Legionnaire*. There are some 300 department, district, and post publications. National headquarters are at Indianapolis, Ind.

Legion of Honor, a French order of merit established by Napoleon on May 19, 1802. It is maintained for the purpose of recognizing civil and military merit. Originally the decoration was a star bearing the portrait of Napoleon, surrounded by a wreath. On one side was the inscription "Napoleon Empereur des Français," and on the opposite side the French eagle, holding a thunderbolt and the inscription "Honneur et Patrie" in its talons. The constitution of the order has been remodeled at different times, but at present five ranks are recognized, those of grand crosses, grand officers, commanders, officers, and chevaliers or knights. By a constitutional provision the membership in each rank or class is limited to the following number: grand crosses to 70, grand officers to 200, commanders to 1,000, officers to 4,000, and chevaliers to 25,000. Membership is limited to those who have served in some military or civil capacity a term of 25 years, attained marked eminence in civil arts, or become noted for skill and bravery in war. The decoration now bears the inscription "République Française, 1870," while the opposite side has two flags and is inscribed "Honneur et Patrie" (Honor

and Country). The chief executive of France is the grand master of the order by virtue of his office.

Legislature (*lĕj'ĭs-lā-tûr*), the lawmaking body of a state or country. It has the power to enact, amend, and repeal laws and resolutions and is subject to the constitution. The chief executive, whether in a republic or a monarchy, has more or less influence upon the legislature, and under certain restrictions may veto its enactments, though in most cases laws and resolutions may be passed over the veto of the chief executive. Originally, as in ancient Greece and Rome, the lawmaking functions were vested in assemblies that were constituted of a large number of the citizens; but later, as the countries became more populous, these powers were delegated to a few representatives chosen by the people. Later the legislative and executive functions were combined in the king or emperor, as in the Middle Ages, but ultimately the commons were granted enlarged powers, and at present all of the leading civilized nations have legislative assemblies constituted wholly or in part of representatives chosen by the popular vote of those entitled to the right of franchise.

In England the body having national legislative functions is known as the Parliament. It is constituted of the House of Lords and the House of Commons. In this respect it corresponds to the highest legislative authority in the Dominion of Canada and the Commonwealth of Australia. Members in the upper house hold their position by heredity or appointment, while those in the lower house are elected by the people. In the U.S. the national legislature consists of the two houses of Congress, the Senate and the House of Representatives. Members of the Senate as well as of the House are chosen by popular vote. In some countries, as in England, the members of the upper house serve for life, and in others, as in the U.S., the term is for six years, and the incumbents may be re-elected any number of times. All of the subdivisions of a nation, such as states and provinces, have legislatures or assemblies for the purpose of enacting laws of a more local character. These likewise consist in most cases of an upper and a lower branch. In cities the legislative authority is vested in a council, and in counties it is exercised by the board of supervisors or the county commissioners. See also *Municipal Government*.

Le Havre (*lĕ ä'vr'*). See *Havre, Le*.

Lehigh (*lē'hi*), a river of Pennsylvania, rising in Wayne County. After a southeasterly course of *ca.* 100 m., it flows into the Delaware River at Easton. The country through which it passes is rich in anthracite deposits. The Lehigh passes White Haven, Mauch Chunk, Allentown, and Bethlehem, and is navigable to White Haven.

Lehman (*lē'mən*), HERBERT HENRY, U.S. Senator, born in New York City, Mar. 28, 1878. After being graduated from Williams Coll. in 1899, he went into the textile manufacturing business and later was a partner in the banking firm of Lehman Brothers (1908-29). A Democrat in politics, he was lieutenant governor of New York State for two terms (1928-32) under Franklin D. Roosevelt and governor for five terms (1932-42), resigning to accept a wartime Federal government post as director of the Foreign Relief and Rehabilitation Agency. He was director of the U.N. Relief and Rehabilitation Admin., 1943-46. In 1949 he was elected to the U.S. Senate to fill the unexpired term of Sen. Robert F. Wagner (*q.v.*), defeating Republican John Foster Dulles (*q.v.*). Re-elected for a full term in 1950, Sen. Lehman announced his retirement from active politics in 1956. He died on Dec. 5, 1963.

NBC Photo

HERBERT H. LEHMAN

Lehmann (*lā'mən*), LOTTE, singer, born in

LOTTE LEHMANN

Perleberg, Germany, July 2, [illegible]. After studying at the Acad. of Music in Berlin, she sang with the Hamburg Opera and the Vienna State Opera and toured Europe. She made her American debut ([illegible]) with the Chicago Opera company and sang ([illegible]) at the Metropolitan Opera. She retired from the concert stage in [illegible]. Her most enduring fame rests on her performances as a lieder singer. She published "Eternal Flight" ([illegible]), "Midway in My Song" ([illegible]), "More Than Singing" ([illegible]), and "My Many Lives" ([illegible]). In [illegible] she became associated with the Music Acad. of the West in Santa Barbara, Calif.

Lehmbruck (*lām'brook*), WILHELM, sculptor, born at Duisburg-Meiderich, [illegible] died by suicide in [illegible]. He received his first instruction at the [illegible] where later he attended [illegible] of. In [illegible] he traveled for the first time to Italy, and two years later had his first ex[illegible] in Paris. There he lived from 1910-14, making his second trip to Italy. After 1914 he [illegible] Berlin except for a one-year stay in Zurich, [illegible] his work from a [illegible] influenced by Aristide M[illegible] for some time, until he came to his own [illegible] expression, which first seemed [illegible]. Soon, however, he found the [illegible] that became most typical for [illegible], for an expressive [illegible] he elongated the [illegible] them strange [illegible] so that there would [illegible]. His best known work, the "Kneeling Woman" (New York Museum of Modern Art) [illegible] was one of the following generation [illegible] works like that. His many drawings, etchings and even paintings [illegible] which consist mostly of nude figures [illegible]

Leibniz (*līp'nits*), GOTTFRIED WILHELM, [illegible] and diplomat, born in Leipzig, Germany, July 1, 1646, died in Hanover, Nov. 14, [illegible]. He was undoubtedly the most versatile and gifted mind of 17th-century Germany, and made valuable contributions to almost every [illegible] of knowledge. However, his wide [illegible] travels and preoccupation with a large number of practical projects (such as his plan to unify the Protestant and Catholic Churches and to form an encyclopedia [illegible] which would bring [illegible] all of knowledge), left him little time to bring his ideas into a coherent unity. His writings [illegible] extremely important, are, therefore, fragmentary [illegible] [illegible] of much [illegible] of highest value also contain much that [illegible] curious and fantastic. As a boy he read deeply in Plato, Aristotle and the Scholastics [illegible] influence of these writings remained [illegible] even after he became familiar with the [illegible] of modern science. He attended the [illegible] of Leipzig [illegible] the faculty of [illegible] until [illegible]. His visit to Paris that year was the beginning of a series of [illegible] foreign centers of learning, which [illegible] Royal Acad. [illegible]

GOTTFRIED WILHELM LEIBNITZ

Leicester

Leicester

Leicestershire

London

Leif Ericsson

Leigh

Courtesy British Information Services, N. Y.

VIVIEN LEIGH

[illegible]

(1938). She made her first television appearance in England in [illegible] as Sabina in "The Skin of Our Teeth."

Leighton [illegible] Jan. 25, 1896. He studied chiefly in Rome and also in Berlin and Florence. His [illegible] early as [illegible] excellent [illegible] "Cimabue's Madonna" [illegible] Acad. [illegible] Queen [illegible] he became [illegible] was [illegible] Dutch," [illegible] several [illegible] "[illegible]" and "Athlete [illegible]."

Leighton [illegible] of Alexander Leighton, born in Edinburgh, Scotland, [illegible] died June [illegible]. His father was [illegible]

Leipzig (līp'tsĭk), or LEIPSIC, a commercial city of Germany, in a fertile region of Saxony, on the Elster River, 75 m. n.w. of Dresden. Many railway lines converge there. It has extensive parks, and many historic buildings and churches. The old portion of the city has narrow streets and interesting old houses, but those in the newer part are entirely modern. The town hall, a large building in the Renaissance style, and the ancient Market Place date from the 16th century. Other [illegible] the market house, the *Reichsgericht* (highest court), the Church of St. John, the public library, the Church of St. Thomas, and the University and the Pauline Church. It has a large museum, several theaters, a castle, and many memorials and statues. An important feature is the Leipzig fair, held in normal times at Easter and Michaelmas. These fairs, which were held formerly from three to five weeks, trace their origin to the 12th century. They made Leipzig one of the most influential trade and exhibition centers of the world. Booksellers came from the world over to attend these fairs. At its height of literary glory, in the mid-18th century, Leipzig was referred to in Goethe's "Faust" as *Klein Paris*, a miniature Paris. Famous students and residents of this cultural center in its great past were Goethe, Fichte, Schelling, Schiller, Sebastian Bach, Mendelssohn, Leibnitz, and Wagner. In addition to a city museum [illegible] sellers' exchange, the city also has an observatory. Among the monuments is one dedicated to victory in several wars, erected in 1888. The manufactures include paper and books, textiles, musical instruments, liquors, ribbons, earthenware, leather, clothing, and scientific instruments.

Educationally, Leipzig has been one of the important cities of the world, containing a fine public school system, several gymnasia, a world famous conservatory of music, business colleges, industrial schools, and the Univ. of Leipzig. This great educational center was founded in 1409.

Originating as a small Slav settlement, the city of Leipzig dates from the 11th century, when it was founded by the Wends. It has been the seat of many historic conventions and battles. In the Reformation it suffered severely, was besieged and taken five different times, and near it, at Breitenfeld, occurred the victory over Tilly by Gustavus Adolphus on Sept. 17, 1631. The so-called "Battle of Nations" occurred here on Oct. 16-19, 1813, in which the allied forces of Prussia, Austria, Sweden, and Russia were pitted against Napoleon. The French were defeated and a step toward Napoleon's final overthrow was accomplished. In this battle Napoleon had an army of [illegible] men, while the allied forces numbered about [illegible]. The city suffered severely from Allied air raids in World War II and later be-

[illegible] a post of the Russian zone of occupation [illegible]

Leith (*lēth*), a seaport of Scotland, on the Firth of Forth, a short distance north of Edinburgh [illegible] and shire. In 1128 it was known as Inverleith. Robert I granted the [illegible] of Leith to Edinburgh in [illegible]. As an export and import city Leith is of growing importance, its trade in coal being par[illegible]

Leitmotiv (*lī'mō-tēf'*), German meaning [illegible]

Leland (*lē'land*), [illegible], author [illegible] Aug. 19, 1824, [illegible] May 20, 1908. He was graduated from Princeton [illegible] Leipzig for two years [illegible] Munich, and Paris. Subsequently he became acquainted with the language of the gypsies by living with them in various [illegible]. He returned to America in 1852, was admitted to the bar, but devoted his time to [illegible]. So, he again went [illegible] Europe, where he remained for 21 years, and [illegible] has attained [illegible] Philadelphia. His publications include "Hans Breitmann's Ballads," "English Gypsies and Their Language," "Master Karl's Sketch Book," "Poetry and Mystery of Dreams," and "Algonquin [illegible]

Leland Stanford Junior University. See [illegible]

Lely (*lē'li*), sir peter, painter, born in West[illegible] land, in 1618. He studied painting at Haarlem [illegible] Gerbier, commenced painting land[illegible] Charles I and Cromwell engaged him to [illegible] portraits, while Charles II made him court painter and knighted him. Lely preserved remarkable faculty, was a careful student of outlines, and became the most distinguished portrait painter of his time in England. At Hampton Court is a collection of portraits of the beauties of the court of Charles II, in which many of his finest productions [illegible]

Le Maître (*lē mā'tr*), [illegible], author and critic, born in Vennecy, France, Apr. 27, 1853; died at Tavers, Aug. 5, 1914. As a [illegible] critic for French magazines and newspapers, Le Maître established a reputation [illegible] of the most acute critical minds of his [illegible]. He wrote fiction, several plays, and considerable [illegible]. His critical sketches were published in what are now two famous classics in the field of dramatic criticism: the seven volume "Contemporaines" (1886-99) and the six volume "Impressions de Théâtre" (1888-98).

Lemon (*lē'mun*), lake, a name frequently applied to Geneva Lake. See *Geneva Lake of*.

Le Mans (*lē mäN'*), capital of the department of Sarthe, France, 132 m. s.w. of Paris. It is located on both sides of the Sarthe River, which is crossed by several bridges. The most noteworthy public building is the St. Julien Cathedral. It has an important trade in farm produce and poultry. The manufactures include cotton and woolen goods, [illegible]. [illegible] was the scene of a decisive battle, in which an army of 100,000 French was [illegible] by the Germans under Prince Frederick Charles. Population, *ca.* 72,000.

Lemars [illegible] County, Iowa, on the Floyd River, 25 m. n.n.e. of Sioux City. It is on the Illinois Central and the [illegible]. The chief buildings include the county court house and the Western Union College (Evangelical). [illegible] machinery. The surrounding country is agricultural. Population, 1900, 5,231; in 1910, 5,844.

Lemberg [illegible] See *Lwow*.

Lemming, [illegible] found in the northern parts of America and Europe, particularly in Norway and Sweden. It is allied to the rat and mouse. Several species have

Courtesy Metropolitan Museum of Art, N. Y.

PORTRAIT PAINTING BY PETER LELY

been described, of which the common lemming of Europe is the best known. It is about 6 in. long and has short tail. The general color is brown [illegible], and the head is large. [illegible] on grass, rootlets, moss, vegetables, and lichens. The burrows, holes, or nests are in burrows a short distance below the surface, in which the

female brings forth several litters of young per year, numbering from three to five at a birth. These animals are noted for migrating at certain periods, especially at the approach of winter, when they form an immense line and proceed in parallel columns. In their course they are preyed upon by flesh-eating animals, such as wolves, foxes, and bears, but they move across streams and mountains and even venture far into large bodies of water, where many lose their lives. The *banded lemming,* found in the vicinity of Hudson Bay, is the best-known American species.

Lemnos (*lĕm'nŏs*), the most northerly island of the Grecian archipelago, lying in the Aegean Sea, off the west coast of Turkey, administrated as part of Lesbos department; area, *ca.* 180 sq. m. Volcanic in origin, the island is largely mountainous; its generally fertile soil yields wheat, fruits, tobacco, and olives. Lemnian earth, which was long sold in Europe for its medicinal qualities, was first found in Lemnos. The island was occupied by the ancient Greeks and figured importantly in Greek mythology as especially sacred to Hephaestus. It was successively held by the Athenian, Roman, Byzantine, and Ottoman empires and has been part of Greece since 1912. Kástron (population, *ca.* 22,500) is the capital and chief port. Population 1940, 25,477.

Le Moine (*lē moin'*), SIR JAMES MACPHERSON, author, born at Quebec, Canada, Jan. 24, 1825; died in 1916. He studied at Le Petit Séminaire de Quebec and in 1850 was admitted to the bar. For some time he served as internal revenue inspector at Quebec, but in the meantime devoted himself to the study of natural history. His writings are partly in French and treat chiefly of history and themes of natural history. They include: "Picturesque Quebec," "Legendary Lore of the Lower St. Lawrence," "Maple Leaves," "Birds of Quebec," and "Ornithology of Canada."

Lemon (*lĕm'ŏn*), the fruit of the tropical or subtropical tree *Citrus Medica,* of the orange family, originally native to the tropical portions of Asia. It is quite certain that lemons were unknown to the ancient Greeks and Romans and that this fruit was introduced into Spain by the Arabs about the 12th century. The lemon tree has since been naturalized extensively. Many highly improved species have been produced by cultivation. The fruit is ellipsoidal, with a protruding point at each end, and from 2 to 4 in. long. It has a bright yellow color, the skin is quite thick, and the internal pulp is very acid and juicy. From 8 to 12 compartments are in the fruit, each containing several seeds. On account of their keeping property lemons are more profitable to grow than oranges. The tree is knotty-wooded, has oval leaves, and grows to a height of about 8 ft. It bears abundantly, many trees producing 3,000 lemons in a favorable season.

The fruit of the lemon tree is gathered while still green, wrapped in small papers, and shipped in boxes for consumption in the general market, the ripening taking place in transit or while kept in the store. Among the favorite species of lemons are the sweet lemon, thin-skinned lemon, common lemon, and citron lemon. The principal uses are for the manufacture of oil of lemon, for flavoring in cookery, to make lemonade and other drinks, as a stimulant in medicine, and for perfumery. Oil of lemon is a volatile product and is secured from the rind by pressure. Lemon extract is made largely from the more imperfect fruit by squeezing, and, after removing all foreign properties, it is prepared with deodorized spirits and filtered. The most extensive production of lemons in the U.S. is in California, Texas, and Florida, where large fields are cultivated, and immense quantities are transported to all parts of America. They are grown in large orchards in the warmer parts of Europe and America, especially in the islands and countries of the Mediterranean. However, the Greek island of Andros and Sicily are particularly important in the lemon culture.

Lemon, MARK, author, born in London, England, Nov. 30, 1809; died May 23, 1870. He studied at a school in Cheam and at an early age began to contribute tales and verses to magazines. In 1841 he joined Henry Mayhew in establishing *Punch,* the well-known humorous periodical of London, of which he was sole manager until his death. For some time he was a writer for the *Illustrated London News.*

Lemur (*lē'mŭr*), a family of mammals allied to the monkey, found mainly in Madagascar, but related species are common in Africa, Southern Asia, and the Philippines. The body, tail, and snout are long. A few species, as the *slender loris,* are tailless, but nearly all have a bushy tail which is about as long as the body. Most of these animals have longer hind legs than fore legs and are peculiarly odd in appearance. All are harmless and some build nests like birds. They inhabit forest districts, move about principally by night, and may be domesticated, when they become docile and playful. The food consists of insects, vegetables, reptiles, birds, and fruits. Most of the species resemble the monkey in many respects, while

Courtesy N. Y. Zoological Society

LEMUR

others have foxlike faces and are about the size of a cat.

Lena (*lē'nạ*), one of the largest rivers in the world, flowing northeast and then northwest through the central Siberian uplands, from the Baikal Mts. to the Laptev Sea in the Arctic Ocean. It is *ca.* 3,000 m. long, with a drainage area of *ca.* 900,000 sq. m. and a delta 250 m. wide at the coast. It has many tributaries, the chief ones being the Vitim and Aldan. It is navigable for *ca.* 1,000 m. near its mouth, when it is ice-free. The valley is fertile; stock raising and farming are important occupations. Coal, oil, and gold are found along its banks. It passes Vitim, Olekminsk, Yakutsk, Ust-Aldan, and Bulun.

Lenard (*lē-närt'*), PHILIP, physicist, born in Pozony, Hungary, June 7, 1862; died in 1947. Lenard began lecturing in 1893 at Bonn Univ., and after teaching at Aachen, Heidelberg, and Kiel, he became professor of physics at Heidelberg in 1907. Lenard did important research on the magnetism of bismuth and on the phenomena of luminescence before beginning his studies on the cathode rays. His investigation of their magnetic deflection and electrostatic properties brought him the 1905 Nobel Prize for physics.

Lenbach (*lān'bäk*), FRANZ VON, artist, born at Schrobenhausen, Germany, in 1836; died in 1904. Although his earlier paintings were for the most part pastoral scenes, Lenbach achieved his greatest success as a painter of portraits.

L'Enclos (*lān-klō'*), NINON DE, lady of fashion, born Anne de l'Enclos, 1615(?) in Paris, France; died in 1705. A famous beauty of the France of Louis XIV, Ninon de l'Enclos reigned in society almost as long and as brilliantly as her sovereign. Her wit and beauty made her salon one of the most popular in Paris for more than half a century, and among her admirers were Cardinal Richelieu, Duc François de la Rochefoucauld, the Prince de Condé, and many other prominent people of her day. Her beauty and charm, even in old age, have made her a celebrated figure.

Lend-Lease (*lĕnd-lēs*), a Federal Act, passed Mar. 11, 1941, when in the course of the wars in China and Europe the defense of the U.S. against attack seemed largely to depend on the support this country could give to nations resisting German and Japanese aggression. Under the Act the President was empowered to provide goods and services to "any country whose defense he deemed vital to the defense of the U.S." Appropriations for defense articles were to be made available by Congress at Presidential request. "Defense articles" comprised any weapon, munition, aircraft, vessel, machinery, metals, fuel, mechanical parts, food, etc.; also the repair of unfit warships.

From Mar. 11, 1941, until May 2, 1941, a Presidential liaison committee conducted Lend-Lease affairs. It was succeeded by the Division of Defense Aid Reports, established in the Executive Office of the President. On Oct. 28, 1941, the Office of Lend-Lease Administration was created and on Sept. 25, 1943, the President consolidated the country's foreign economic operations in the Foreign Economic Administration and transferred to it all Lend-Lease functions. This agency was abolished on Oct. 20, 1945, and Lend-Lease administrative functions were transferred to the Department of State.

Procurement of Lend-Lease supplies and services was handled by the War and Navy Departments, the Treasury, the Department of Agriculture, the Maritime Commission, and the War Shipping Administration. Up to July 1, 1946, the President had submitted 22 reports on Lend-Lease operations to Congress, as required under the Act.

Total Lend-Lease aid, from the inception of the program in March 1941 to the end of 1945, aggregated $49,096,000,000, or approximately 15 per cent of the total war expenditures incurred by the U.S. The British Empire and the U.S.S.R. received 94 per cent of all Lend-Lease aid; more than two-thirds of the total was supplied to the British and about one-fourth of the total went to the U.S.S.R. For the defense of the Western Hemisphere and to aid in the prosecution of World War II, the American republics received Lend-Lease aid, amounting to $434,000,000, less than one per cent of all Lend-Lease.

In the months immediately following the passage of the Act, when Great Britain was threatened with invasion, most of the Lend-Lease exports went to the United Kingdom. Lend-Lease was extended to the Soviet Union after its invasion by Germany. The shipment of vast quantities of planes, tanks, guns, etc., aided materially in the successful Soviet counteroffensives. Lend-Lease to the Mediterranean area played an important part in the expulsion of the German armies from this area. Moreover, French, Belgian, Dutch, Norwegian, Polish, Yugoslav, and Greek patriots were equipped with Lend-Lease arms and supplies.

Soon after the attack on Pearl Harbor (Dec. 7, 1941) and the German and Italian declarations of war on the U.S., the miracle of American production became apparent everywhere. The British Isles were converted into an invasion base for the liberation of Europe by American Lend-Lease supplies as well as by British products. In the Pacific, Lend-Lease goods added power to Australia and New Zealand, fortifying them as bases in the strategy which defeated Japan. The flow of Lend-Lease supplies to China was not stalled even when the Burma Road was lost (Apr. 1942); American and Allied pilots, flying supplies from India "over the hump" to the Chinese ally, delivered one cargo every 2½ minutes.

Not long after the entry of the U.S. into the war, Lend-Lease was transformed into a "two-

way street." By means of the so-called *Reverse Lend-Lease Aid*, the U.S. received from Lend-Lease countries capital installations such as airfields, hospitals, barracks and depots, foodstuffs, petroleum products, shipping, railroad transportation, and other services. As of Sept. 2, 1945, the reverse Lend-Lease had a value of $7,346,000,000, the British Empire providing by far the greatest aid, totaling $6,306,000,000.

On Feb. 23, 1942, a *Lend-Lease Master Agreement* was signed by the U.S. and England, stating the conditions governing Lend-Lease help. This was followed by similar agreements with other countries. These contracts provided that defense articles transferred under Lend-Lease which were not destroyed, lost, or consumed, and which should be determined by the President to be useful in the defense of the Western Hemisphere, or otherwise of use to the U.S., would be returned. Furthermore, in determining the benefits to be provided to the U.S., cognizance should be taken of the contributions a Lend-Lease partner provided to the U.S. The Master Agreements had already taken note of postwar trade by including promises to promote advantageous economic relations and to eliminate discriminatory treatment in international commerce.

Courtesy U. S. Department of State

After the war, special agreements were entered into with various governments, providing for payment for all goods received, but not consumed in the war effort and taken over by the other country for its own use. By March 1951, settlements for Lend-Lease had been made with 27 nations; some amounts due had been paid, while others were payable over an extended period.

L'Enfant (*lăn-făn'*), PIERRE CHARLES, soldier and architect, born in Paris, France, Aug. 2, 1754; died in Maryland, June 14, 1825. While still a young man, L'Enfant came to the U.S. with Lafayette to join the Continental Army as an engineer (1777). He fought in the siege of Savannah, Ga., and other battles in the South and was discharged in 1784. At the invitation of George Washington he drew up plans and supervised the first stages of construction for the capital city of the U.S., Washington, D.C., in 1791. When, in 1792, the plan proved to be over-expensive, he was relieved of the commission. However, the principle of his scheme is still obvious in the present layout of the city, a combination of radiating avenues, as in European cities of the 18th century, with the square block system which has developed in the U.S. See also *City Planning*.

Lenin (*lyĕ'nĕn*), NIKOLAI (VLADIMIR ILYTCH ULYANOV), lawyer, statesman, Russian revolutionary leader, born at Simbirsk, Russia, April 9, 1870; died at Gorky, near Moscow, Jan. 21, 1924. Influenced by his study of the works of Karl Marx, he allied himself, despite his noble birth, with the growing Socialist movement. After studying law at the Univ. of Kazan, he began practice in Samara (1892), soon moving to St. Petersburg (Leningrad), where he was later arrested for spreading Socialist propaganda and exiled to Siberia (1897). Here he married his fellow worker in exile, Nadezhda Krupskaya (1869-1929), and finished writing "The Development of Capitalism in Russia" (1899). Upon his return he continued propaganda and organizational work for a program of Marxian Socialism, accepted by the Bolsheviks (majority faction) at the Russian Social Democratic Congress in London, England (1903). As leader of the Bolsheviks he visited many European nations, advocating Socialism, preaching against war, and creating plans for a Communist International (Switzerland, 1915). Returning to Russia in 1917, he and Leon Trotzky (*q.v.*) headed the revolutionary movement, ultimately establishing the Soviet government. Leader of the Soviet of the People's Commissars and of the Communist

NIKOLAI LENIN

Courtesy Sovfoto, N. Y.

Party, Lenin became dictator of its policies until illness forced him to resign in 1921, the year in which he formulated the New Economic Policy (NEP). A deep thinker, indefatigable worker, and able leader, Lenin died at Gorki (1924). His body was placed in a shrine at Moscow. He is regarded as the founder of the U.S.S.R. and the genius behind its socialistic reforms.

Leningrad (*lĕn'ĭn-grăd*), formerly St. Petersburg or Petrograd, the second most important city of the U.S.S.R., at the end of the Gulf of Finland, where the gulf is entered by the Neva River. This stream divides into numerous branches, thus forming a large number of islands. Bridges connect these islands with the city; thus the islands form a part of Leningrad. Much of the city is built on flat ground, which was formerly marshy. A systematic plan of continually building the city further toward the sea and redeeming tracts covered by water has added to the extent of the city and improved its means of access by vessels. Improvements have been made by the construction of concrete and granite embankments, and many of the channels have been greatly deepened by dredging.

Description. The architecture in the fashionable parts of the city is largely of gray stone. Prospect of the 25th October (formerly Nevski Prospect) is one of the finest streets in Europe. A few of the many beautiful squares are Decabrist's Square, Mritzky Square, and Square of the Revolution.

The fortress of Sts. Peter and Paul is located on a small island, which is connected with the mainland by a bridge. The fortress contains the Cathedral of Sts. Peter and Paul, where the czars and many persons belonging to the royal families are buried. The commercial exchange is located on one of the islands and near it are several educational institutions. Peterburgsky Island contains many beautiful residences, while others are utilized as public parks and resorts. Retail trading is carried on chiefly by a system of markets which are managed by the municipality. These markets not only handle foodstuffs, but also conduct a large trade in clothing and footwear.

Leningrad contains many palaces, among which is the palace of the former grand duke Michael, considered one of the finest pieces of early 19th-century architecture in the city. Other important buildings include the government buildings, the stock exchange, the Marble Palace, the buildings of the Holy Synod, and numerous hospitals and national institutions. Leningrad is the center of science and research in the U.S.S.R. The Acad. of Science, founded by Peter the Great in 1725, has an extensive library. Other institutions of higher learning include the Acad. of the History of Material Culture, the Astronomical Inst., the Botanical School, the Geographical Inst., the Inst. of Civil Engineering, the Labor Inst., the Mining Inst., the Russian Hydrological Inst., and many others.

LENINGRAD. CHURCH OF OUR SAVIOUR

With its fantastic array of brilliantly colored domes and cupolas, the church, built in characteristic Russian style, is one of the most spectacular structures in the country. It was erected in the late 19th century and marks the spot where Alexander II was assassinated in 1881

Industries. Leningrad has a vast interior and foreign trade. The former is facilitated by a large number of canals and railroads that center in the city. It has a large harbor. The manufactures include leather, cotton and woolen goods, clothing, gobelin tapestry, liquors, sugar, tobacco products, porcelain and glass, farming implements, hardware, clothing, textiles, telephone and metal works, and machinery. It has a large trade in corn, fish, rye, wheat, livestock, lumber, and coal.

History. A settlement was founded at the mouth of the Neva by the Swedes in 1300, but it was soon destroyed. The region was occupied by Peter the Great in 1703, in which year he began to build the fortress of Sts. Peter and Paul. As a means of establishing the influence of Russia among the powers of the Baltic and to become freed from the adverse influences at Moscow, he removed the capital from Moscow to St. Petersburg in 1712. Many peasants were required by an imperial order to take up their residence in the new city, which began to grow rapidly. Under the successors of Peter it was greatly improved and embellished. Catherine II promoted the construction of a network of canals inland and

Courtesy Sovfoto, N. Y.

LENINGRAD. DVORTSOVAYA SQUARE

The square is dominated by the Alexander Column in its center. The palace in the background, formerly the residence of the Russian czars, was built by the 18th-century architect Francesco Rastrelli.

the drainage of large tracts of marshy land surrounding the city. She not only built beautiful palaces for the royal family, but constructed a number for her favorites. At the start of World War I, the name of the city was changed to Petrograd; at the death of Lenin, in 1924, the name of the city was changed to Leningrad. During World War II, it was the scene of an important Russian victory (1943) when a 17-month siege laid by the Germans was raised with the Russian recapture of Schluesselburg and Snyavino. Population, over 3,000,000.

Lenormant (*lę-nôr-män'*), CHARLES, art critic and archaeologist, born in Paris, France, June 1, 1802; died in Athens, Greece, Nov. 24, 1859. He studied law, but, after traveling in Italy, decided to devote his life to archaeological research. He accompanied Jean François Champollion (1790-1832) to Egypt in 1828, where he assisted in exploring several ancient ruins, and, after returning to France, was made professor of Egyptian archaeology at the Coll. of France. He wrote "Introduction to Oriental History." His son, *François Lenormant* (born in Paris, Jan. 17, 1837; died there Dec. 10, 1883), likewise attained to fame as an archaeologist.

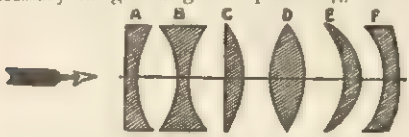
Lenotre (*lē-nō'tr*), ANDRÉ, landscape gardener, born in Paris, France, Mar. 12, 1613; died Sept. 15, 1700. He studied painting with Lebrun (*q.v.*), but soon gave it up for the work of a landscape artist. Later he succeeded his father as superintendent of the gardens of the Tuileries. He laid out many noted parks, including those of Versailles, Fontainebleau, and Chantilly. In 1678 he went to Rome, where he laid out the gardens of the Vatican and the Quirinal. Later he platted the Kensington and St. James gardens in London.

Lenox (*lĕn'ŭks*), JAMES, philanthropist, born in New York City, Aug. 19, 1800; died Feb. 18, 1888. After being graduated from Columbia Coll., he studied law, and at the death of his father inherited a vast fortune. He devoted nearly a half-century to the collection of books which in 1870 were valued at $1,000,000, and these he donated to found the Lenox library in New York City. This library was later merged with the Astor and Tilden libraries to make the base of the present New York Public Library. He gave land and $500,000 for the erection of the Presbyterian hospital. His cash gift to the Lenox library was $450,000.

Lenroot (*lĕn'rōōt*), KATHERINE F., public official, born in Superior, Wis., in 1891. After graduation (1912) from the Univ. of Wisconsin, she was appointed to the research staff of the Industrial Commission of Wisconsin. Two years later she joined the staff of the Children's Bureau (then a division of the U.S. Dept. of Labor). In 1922 she was made assistant chief and in 1934, head of the bureau. She retired in 1951. During her tenure she represented the U.S. at numerous international conferences; she served as secretary of the Temporary Social Commission of the U.N. Economic and Social Council at its first meeting. Among awards granted her were the Rosenberger Medal (1942) of the Univ. of Chicago for distinguished service in social work in the U.S. and the gold metal of the National Inst. of Social Sciences (1947).

Lens (*lĕnz*), in optics an instrument which refracts the luminous rays proceeding from an object in such a manner as to produce an image, real or virtual, of the object. Lenses are used in various instruments such as microscopes, photographic cameras, telescopes, etc. A lens is a piece of transparent substance, usually glass, so called from the resemblance in form to the seed of a lentil, which is like a double-convex lens. A lens is shaped so as to afford two regular opposite surfaces, both curved, or one plane and the other curved, and designed to change the direction of rays of light, and for increasing or diminishing the apparent size of objects viewed through it. A lens that hollows or rounds inward is said to be concave; one that rounds outward, convex. The curved surfaces are usually spherical. Six distinct kinds of the ordinary lenses of this description are in general use. They are employed in the manufacture of telescopes, opera glasses, stereoscopes, spectacles, microscopes, lanterns, and other

instruments and devices. The best grade of crown or flint glass is used in making lenses for microscopes and telescopes, and since great accuracy is necessary in grinding and polishing, the lenses



A Plano-concave; *B* Double-concave; *C* Plano-convex; *D* Double-convex; *E* Meniscus; *F* Concavo-convex

for the larger instruments represent much value. The six varieties of curved lenses include the double-convex lens, plano-convex, double-concave, meniscus, plano-concave, and concavo-convex. The *menisci* are lenses in which the convexity is greater than the concavity, and the *concavo-convex* have greater concavity than convexity. See *Light; Optics.*

Lent (*lĕnt*), in Latin, *Quadragesima,* the great 40-day fast of the Christian Church, extending from Ash Wednesday through Easter eve. The six Sundays included are not observed as fast days. Beginning with a period of only 40 hours, commemorating the period from the Crucifixion to the Resurrection, the season was gradually extended, and by the seventh century it had become standarized at 40 days. The 40 days of Jesus' temptation and the fasts of Moses and Elijah enter into the symbolism of the fast.

Commemorating the Passion of Christ (*q.v.*), Christians make the period a time of strict spiritual discipline, of which abstinence from meat, frugality, and self-denial of pleasures are the external marks.

Each of the six Sundays in Lent is commonly known by the first word of the Introit for that day according to the Roman rite: *Invocavit, Reminiscere, Oculi, Laetare, Judica,* and *Palmarum.* The last two weeks of Lent are called Passiontide and are concerned entirely with the sufferings and death of Jesus Christ. The final week is Holy Week (*q.v.*), introduced by Palm Sunday, which commemorates Jesus' entry into Jerusalem. Maundy Thursday (*q.v.*) is the day of the institution of the Lord's Supper or Eucharist or Mass (*q.v.*). Good Friday (*q.v.*) is the day of Crucifixion. Saturday is the day when the Body rests in the tomb. Lent then ends with the joyous celebration of the Resurrection of Christ (*q.v.*) on Easter Sunday, the major festival of the Christian year.

Lentaigne (*lĕn-tān'*), WALTER DAVID ALEXANDER, British army officer, born in Burma, July 15, 1899; died in London, England, June 24, 1955. The son of a British judge, he was educated in England and then returned to Burma. Until the outbreak of World War II, he held commands in Burma and India, mostly leading British or Indian troops in putting down tribal wars and uprisings on the Indian frontiers. In World War II he soon joined forces with Gen. Orde Charles Wingate (*q.v.*), who was training mixed groups of British and Ghurka troops to infiltrate Japanese-held territory. These men, known as Wingate's Raiders, in 1944, landed a large force by glider behind Japanese lines and set up an air field for Allied planes. This action helped to open the Burma Road. When Wingate was killed in March 1944, Lentaigne took command of the raiders. In a few months, however, they were absorbed in the command of Gen. Joseph W. Stilwell (*q.v.*).

Lentil (*lĕn'tĭl*), a leguminous plant (*Lens esculenta,* known also as *Ervum lens*) grown widely in Europe and elsewhere. It grows as high as 20 in. and has many branches and whitish or pale-blue flowers. The pods each hold two seeds about the size of peas. The garden lentil and the field lentil are the two species grown in Germany, France, Syria, and Egypt. Lentil straw is a good fodder for stock. In cookery, the seeds, also called lentils, are used for soup or are baked and prepared much as beans and peas are. Formerly unknown in Canada and the U.S., the lentil has been introduced there.

Lenz (*lĕnts*), JACOB MICHAEL REINHOLD, poet and dramatist, born in Sesswegen, Livonia, Jan. 12, 1751; died near Moscow, Russia, May 24, 1792. He was friendly with Goethe (*q.v.*) in Strasbourg and Weimar. Some of his lyric poetry was written to Friederike Brion, Goethe's early love. His best-known plays were *"Der Hofmeister"* (1774) and *"Die Soldaten"* (1776). He suffered a mental illness in 1788.

Lenz's Law (*lĕn'zĕz*), a principle of electrodynamics first stated by H.F. Emil Lenz (1804-65), a German physicist. It states that when a current is set up by a change of magnetic flux through a circuit, its direction will oppose the act which caused it. For example, the motion of a conductor across a magnetic field creates in the conductor an induced current which sets up a magnetic field opposing the motion.

Leo (*lē'ō*), a constellation. See *Zodiac.*

Leo, the name of 13 popes, four of whom are treated in articles below; the other nine reigned as follows: Leo II, from August 682, to July 684; Leo IV, from 847 to 855; Leo V, succeeded Benedict IV, in 903, and reigned 30 days; Leo VI succeeded John X, in 928, and reigned about seven months; Leo VII, from 936 to 939; Leo VIII, from 964 to 965; Leo IX, from 1049 to 1055; Leo XI succeeded Clement VIII, on April 1, 1605, and died on the 27th of the same month; Leo XII, from 1823 to 1829. See *Pope.*

Leo I, SAINT, surnamed The Great, Pope of Rome, born in Rome (possibly Tuscany), *ca.* 400; died there, in 461. He was descended from a dis-

tinguished family, received a liberal education, and in 440 succeeded Sixtus III as pope. In the early part of his reign the Huns threatened to overrun Italy, and, after Attila captured Aquileia, he led his hosts against Rome, but Leo met him at the Po River and persuaded him to spare the city. In 455 the Vandal chief Genseric made an attack upon Rome, but would not be persuaded by Leo to spare the city, though at his request he refrained from murder and exempted the oldest basilicas from plunder. Leo was distinguished for remarkable zeal in pontifical duties. His letters and other writings are strong evidences of his devotion and ability.

Leo III, Pope of Rome, born in 750; died June 11, 816. He was a native of Rome and was elected to succeed Adrian I on Dec. 26, 795. During his reign occurred the establishment of the Western Empire. His pontificate was disturbed by several conspiracies, the first occurring in 799, when he retired to Spoleto, but soon after met Charlemagne in conference at Paderborn. Subsequently he was received at Rome with much honor and, in 800, he crowned Charlemagne as Emperor of Rome. The latter granted him temporal sovereignty over the city and state of Rome, and in 804 Leo visited the court of Charlemagne at Aix-la-Chapelle. In 815 a conspiracy was formed against Leo, on account of which a number of participants were executed. This led to a dispute with the successor of Charlemagne, Louis the Debonair, and the sovereign jurisdiction of Leo in Rome was called into question. The controversy was not concluded until after his death.

Leo X, GIOVANNI DE' MEDICI, Pope of Rome, born in Florence, Italy, Dec. 11, 1475; died Dec. 1, 1521. He was the second son of Lorenzo de' Medici, who prepared him for an ecclesiastical career, and secured the ablest scholars obtainable as his teachers. Innocent VIII made him a cardinal when he was only 13, and, when the Medici family was expelled from Florence, he sought the acquaintance of learned society by traveling in Germany, France, and The Netherlands. In 1503 he returned to Rome. Julius II appointed him legate in 1511, a position by which he secured nominal direction of the Spanish and papal army which was then besieging Bologna. On Apr. 11, 1512, the French and Italian troops were successful in the Battle of Ravenna and he was taken prisoner. When the conquering army evacuated Milan, he effected his escape. On Mar. 11, 1513, he succeeded Julius II as Leo X. Soon after his election the King of France made an effort to conquer Milan, but Leo repelled the invasion and began to solidify and strengthen his dominion.

Pope Leo began early in his pontificate to favor learning, for which purpose he called to his assistance the most eminent scholars of his time, among them Bembo and Sadoleto, who became

LEO X

Painting by Raphael (1483-1520)

his secretaries. He established a Greek college at Rome, endowed a number of Greek newspapers, and encouraged sculpture, painting, architecture, and internal improvements. Desiring to rebuild St. Peter's, he permitted the issuance of indulgences to contributors, a course which stimulated the Protestant Reformation in Germany to greater activity under the leadership of Martin Luther. Leo treated the Reformation as a controversy between Luther and Tetzel, but condemned Luther's doctrines and sought at first to counteract them by moderate means, and afterward by more severe procedure, but the rising was too powerful and the papal loss in Germany became irreparable. Leo ranks in history as a man of excellent private conduct and moral rectitude, and died amid political prosperity, but with the Reformation in a state of vigorous development.

Leo XIII, Pope of Rome, son of Count Ludovico Pecci, born in Carpineto, Italy, Mar. 2, 1810; died July 20, 1903. He entered the Jesuit college at Viterbo in 1818, later studied at the Collegio Romano, and subsequently taught philosophy. His ability as a student and speaker was recognized at an early date; he was able to write Latin with facility at the age of 12 and showed like aptitude in other branches of study. His education was completed at the Coll. of Noble Ecclesiastics and the Roman Univ. and, in 1837, Gregory XVI conferred the priesthood upon him. Subsequently he filled a number of important positions in the church, was created cardinal by Pius IX in 1853, and in 1877 was appointed to fill the important office of cardinal *camerlengo* of the Roman Catholic Church, succeeding Car-

Courtesy Brown Bros., N. Y.

LEO XIII

dinal de Angelis. In that position he was head of the church in temporal matters, made arrangements for the last solemn obsequies of Pius IX, and received the Catholic ambassadors for the conclave. On Feb. 20, 1878, he was chosen successor to Pius IX, assuming the name of Leo XIII.

The policy of Pope Leo from the first was to act with modern means in government, but he maintained the right of restoration to the temporal power and sovereignty. Among his most noted achievements may be enumerated the arbitration in relation to the *Kulturkampf* in Germany, the establishment of terms with the clergy in France, and the restoration of the hierarchy in Scotland. In a dispute between Germany and Spain, in relation to the Caroline Islands, he acted as arbitrator, and took a prominent part in suppressing the slave traffic in Africa. As affecting the laboring classes he promulgated several letters in opposition to socialism, indicating that the labor question may be settled by the application of Christ's religion under the influence and authority of the Papacy. He maintained views regarding education in opposition to secularization. He gave support to the ancient doctrine that the pope stands as the vice-regent of Christ and, in an open letter to W.E. Gladstone, confirmed the explicit view of his predecessors that all ordinations under Anglican rites are invalid. As a scholar he had a high standing, encouraged learning, and wrote a number of poems.

Leochares (*lē-ŏk'a-rēz*), a famous sculptor of ancient Greece, who flourished in the 4th century B.C. He is classed as a member of the younger Attic school. Among his productions are a statue of Isocrates and his "Abduction of Ganymede by the Bird of Jove," besides other portrait statues. Philip of Macedon engaged him to execute memorials of his victory at Chaeronea.

Leominster (*lĕm'in-stĕr*), a town of Worcester County, Massachusetts, on the Nashua River, 5 m. S. of Fitchburg. It is on the Boston & Maine and the New York, New Haven & Hartford R.R.'s. The surrounding country is agricultural and dairying. The manufactures include plastics, furniture, combs, linen and woolen goods, buttons, clothing, toys, and baby carriages. It was settled in 1725, but was a part of Lancaster until 1740, when it became separate. It was incorporated as a city in 1915. Population, 1950, 24,075.

León (*lā-ōn'*), a city in the state of Guanajuato, Mexico, 32 m. W. of Guanajuato. The site is in a fertile plain, on railways and regular routes of travel. It has manufactures of machinery, cotton and woolen goods, and leather. Among the chief buildings are a library, the city hall, and a number of schools and churches. The jobbing trade is extensive. Population, *ca.* 65,000.

León, the principal city of Nicaragua, Central America, capital of the department of Léon, on the shore of Lake Managua, 12 m. from the Pacific. It is surrounded by fertile plains, has good railroad connections, and is well improved with pavements and parks. Léon contains an episcopal palace, a cathedral, several churches, and the Coll. of St. Ramon. The manufactures and commercial enterprises are important. It has a trade in livestock, cereals, fruits, and merchandise. Population, *ca.* 40,000.

León, capital of the province of Léon, Spain, 81 m. N.W. of Valladolid. It is celebrated as the capital of an ancient kingdom of the same name. The city was founded by the Romans, who named it Legio. Population, *ca.* 20,000.

Leonardo da Pisa (*lā-ō-när'dō dä pē'zä*), or LEONARDO BONACCIO, mathematician, born in Pisa, Italy, in 1170. He studied under a master who taught the Arabic system of arithmetic, and traveled in Syria and Egypt, which enabled him to extend the knowledge of mathematics in Europe. Some writers think he was the first to introduce algebra into Europe. It is not known when he died.

Leonardo da Vinci (*lā-ō-när'dō dä vēn'ché*). See *Vinci*.

Leoncavallo (*lā-ōn-kä-väl'lō*), RUGGIERO, composer and librettist, born in Naples, Italy, Nov. 8, 1858; died near Florence Aug. 9, 1919. After studying at the Naples Conservatory, Leoncavallo made a tour as a pianist at 16. Although the initial performances of his first opera, "Chatterton," were not successful, he soon made a name for himself as an outstanding Wagnerian disciple in the composition of opera. Among the most popular of his works are "I

Pagliacci" (1892) and "*La Bohème*" (1897).

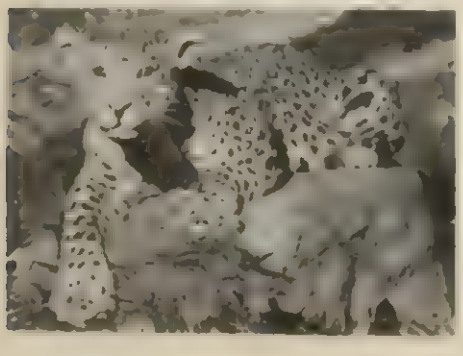
Leonidas (*lē-ŏn'ĭ-dăs*), King of Sparta, born in the latter part of the 5th century B.C. He was the son of Anaxandrides, succeeded his half brother, Cleomenes I, as King of Sparta, and distinguished himself in defending the pass of Thermopylae against Xerxes (480 B.C.). The Greeks placed Leonidas in command of the forces designed to defend the pass. With a force of 5,000 Greeks, aided by about 300 Spartans, he made a heroic defense with apparent success, but the Persians were informed of a mountain pass, through the treachery of Ephialtes, and in attempting to resist the combined attack from front and rear Leonidas and the band of 300 Spartans fell after making a remarkable resistance. The meaning of this heroic resistance has been best expressed in the words of Simonides of Ceos (556-469 B.C.):

"Go tell the Spartans, thou that passeth by,
That here, obedient to their laws, we lie."

Leonora (*lē-ō-nō'rä*), opera by the American composer William Henry Fry (1815-64). Its first performance in Philadelphia, Pa., 1845, marked the first public production of any American opera.

Leopard (*lĕp'ĕrd*), a ferocious, carnivorous mammal native to Asia and Africa. It is regarded by some writers as allied to the panther, by some as a species of it, and by still others as a distinct species. The color is largely a pale fawn spotted with dark brown or black in rosettes or broken rings. The lower part of the body is whitish, the tail is long, and the animal's movements are graceful and rapid. It can leap over precipices with ease and readily ascend trees, from which it springs with deadly accuracy upon its prey. It is usually between 6 and 7½ ft. in length. The leopard is bloodthirsty, often killing more than it can devour, for the sake of the fresh blood, and steals from ambush upon its prey, usually poultry, deer, antelope, or any animals it can destroy. Its favorite haunts are in the woods. Its size and strength are sufficient to enable it to overcome a man, but [illegible]

LEOPARD
Courtesy American Museum of Natural History, N. Y.



defense. See also *Panther*.

Leopardi (*lā-ō-pär'dē*), COUNT GIACOMO, scholar and poet, born at Recanati, Italy, June 29, 1798; died in Naples, June 14, 1837. He was descended from a family of the ancient nobility. Left to his own devices as a child, without companionship, pocket money, or means of recreation, he turned to the study of classical literature and languages. At an early age, he was able to speak Latin and Greek, and developed proficiency in French, Spanish, Hebrew, German, and English. His youthful writings included a Latin treatise on the Roman rhetoricians of the 2nd century, a commentary on Porphyry's life of Plotinus, and a long poem, "*Appressamento alla Morte*." Several odes written at this time expressed his despair over the political and spiritual decadence of Italy. Following a trip to Rome in 1822, he wrote the lyrical poem "*Bruto Minore*," which contained the essence of this pessimistic philosophy which was to pervade all of his writings. In 1825 he accepted a commission to edit Cicero and Petrarch and for a time lived in Bologna, enjoying the friendship of the Countess Malvezzi. His prose work "*Operette Morali*" (1827) reflected a despondency and contempt for human ignorance. Like much of his work, it was a masterpiece as to form, but of questionable merit from a philosophical point of view. With the aid of the Swiss philologist, De Sinner, he was able to publish (1834) his philological studies "*Excerpta ex schedis criticis*." In 1832 he met the young writer Antonio Ranieri, in whose home in Naples he spent the last years of his life. His fine lyrical poem "*La Ginestra*" was published in this period. "The Sequel to the Battle of the Frogs and Mice" (Paris, 1842) was a satire on the unsuccessful republican insurrection at Naples. His writings include many dialogues in prose and several volumes of poetry.

Leopold (*lē'ō-pōld*), the name of two German, or Holy Roman, emperors. LEOPOLD I was born June 9, 1640, became King of Bohemia and Emperor of Rome in 1658, and died May 5, 1705. LEOPOLD II, son of Francis I, was born May 5, 1747, became emperor in 1790, and died March 1, 1792. The latter was succeeded by his son Francis II.

Leopold I, King of the Belgians, born in Coburg, Germany, Dec. 16, 1790; died in Laeken, Belgium, Dec. 10, 1865. He was the son of Francis, Duke of Saxe-Coburg-Saalfeld, received a liberal education, and entered the Russian army, in which he became a general. He took part in the battles of Lützen, Bautzen, Leipzig, and Cologne. After the peace of 1815, he visited England, where he married Princess Charlotte, heiress to the throne, in 1816, and received an annual pension of $250,000. After Princess Charlotte died in 1817 he resided in London. In 1830 he declined the crown of

Greece. A national congress elected him King of the Belgians in 1831 and, on July 21 of that year, he was inaugurated at Brussels. The following year he married Princess Louise, daughter of the French king, Louis Philippe. His wife died in 1850, but had in the meantime borne three children, including the Crown Prince Leopold, another son, and a daughter.

Leopold II, King of the Belgians, son of Leopold I, born in Brussels, Apr. 9, 1835; died 1909. He was educated in the leading schools of Belgium and Germany. His title as crown prince was Duke of Brabant. He served as a member of the national senate, in which he became distinguished as an influential advocate of internal and maritime improvements. On Aug. 22, 1853, he married Archduchess Maria of Austria. At the death of his father, on Dec. 10, 1865, he was crowned as Leopold II. In policy his administration was mindful of the constitution and followed the policy of the vigorous reign of his father. He took an active interest in promoting the exploration of Africa and was practically the organizer of the Congo Free State, which region was placed under his sovereignty in 1890 by an international conference. Like his father, Leopold I, he was a highly successful and popular monarch.

Leopold III, former King of the Belgians, son of Albert I, born in Brussels, Nov. 3, 1901. His studies at Eton, England, were interrupted by World War I, during which he served with the Belgian army. On the death of his father, he acceded to the throne on Feb. 17, 1934. A year later his wife, the former Princess Astrid of Sweden, was killed in an automobile accident.

On May 10, 1940, Germany attacked Belgium, and on May 28, Leopold capitulated (see *World War II*). With Belgium under German occupation, he remained at his palace at Laeken, near Brussels, where he married a commoner, Mlle. Marie Baels, in 1941. In June 1944 he was interned in Germany, and in May 1945 he was liberated by the U.S. Army.

Meanwhile, in 1944, the Belgian parliament had confirmed his brother Charles as prince regent. Following his liberation, Leopold and his family lived in exile. Leopold, supported by the Social Christian party, expressed the wish to be reinstated as king, but his position was not clarified in a series of popular votes. But, on June 4, 1950, another election was held in which a small majority favored the king's return by giving the Social Christians 47.6 per cent of the seats. Leopold subsequently returned to Belgium on July 22, but the sentiment against him among the Liberals and Socialists was so strong that he was forced to turn over his powers to his oldest son, Prince Baudouin, on Aug. 1.

The Belgians never forgave Leopold for his seeming tolerance of the Germans during the occupation, and he formally abdicated on July 16, 1951. In 1957 he was named head of a commission to study means of applying scientific advances to economic and social life, and in 1959 he visited the Belgian Congo after nationalists had staged independence riots there.

Léopoldville (*lā'ō-pōld-vēl*), capital of the Republic of the Congo (Léopoldville)—the former Belgian Congo (*q.v.*)—and of a province of the same name, in Central Africa on the south bank of the Congo River, at the outlet of Stanley Pool. A modern city of steel and concrete buildings and wide avenues, it is a trade center with 12 m. of port installations. Lovanium Univ. is located here. The city was named for Leopold II of Belgium. Population, 1957, 299,806. See also *Brazzaville*.

Lepanto (*lē-păn'tō*), or NAUPAKTOS, a seaport of Greece, on the north coast of the Gulf of Corinth, or Lepanto. Anciently it was of vast commercial importance. It came into the hands of the Athenians after the Persian wars. The Venetians fortified it in 1477 and improved its harbor. On Oct. 7, 1571, a memorable battle occurred near Lepanto between the fleet of the Turkish sultan and the allied fleets of Philip II of Spain, Pope Pius V, and the republic of Venice. Prince Don John of Austria commanded the allied fleets, while the Ottoman fleet was under the command of Uluch Ali of Algeria, Ochiali Pasha, and Mohomet Sirocco of Egypt. The battle raged for hours and terminated in the destruction of the Ottoman fleet of 200 galleys and 60 other vessels. From the Battle of Lepanto dates the decline of Turkish power in Europe.

Lepidus (*lĕp'i-dŭs*), M. AEMILIUS, member of the second Roman triumvirate. He first became prominent as a consul in 46 B.C. He was a man of much wealth and influence and was appointed by Caesar to the government of Narbonensis in Gaul, in 44 B.C. Caesar's death occurred before Lepidus left Rome, and, accordingly, he sided with Mark Antony. In 43 B.C. he joined Octavianus and Antony in the triumvirate and received as his share of the empire Narbonensis and Spain. The following year he received Africa, where he ruled until 36 B.C., and, after endeavoring to seize Sicily, he was deposed from the triumvirate by Augustus and banished to Circeii, where he died in the year 13 B.C.

Lepidoptera (*lĕp'i-dŏp'tĕr-a*). See *Insects*.

Leprechaun (*lĕp'rē kăn*), a being in Irish mythology, supposed to be about 2 ft. tall and closely resembling an old man.

Leprosy (*lĕp'rō-sĭ*) or HANSEN'S DISEASE, a chronic, infectious disease of man, caused by *Mycobacterium leprae*. Characterized by inflammatory lesions and ulcerous eruptions of the skin and mucous membranes, it also affects the nerves and internal organs of the body. Leprosy is not

[illegible] thought, the causative organism has been definitely isolated and [illegible] for [illegible] germs. The name Hansen's disease (or HD), preferred by some patients with the disease because of the historical connotations of the term leprosy, is derived from the name of the Norwegian physician, Gerhard Armauer Hansen, who discovered the germ in 1874. It has been generally accepted that the modern disease of leprosy is not the "leprosy" in the Bible, particularly that of the Old Testament.

Long-continued and intimate contact with a victim of leprosy is believed necessary for transmission, which accounts for its tendency to occur in families and densely populated areas. The disease is confined for the most part to certain sections of Africa, Asia, Central and South America, and some Pacific island areas. In the U.S., small local areas are affected—these are found in Louisiana, Florida, Texas, and, to a lesser extent, [illegible].

[illegible] the extremities are always involved in the [illegible] Involvement of these nerves is followed by muscular atrophy and contractures, usually associated with [illegible] of the hands, especially those of the fingers and toes. The eyes are frequently affected, and blindness may result. [illegible]

[illegible] fatal to itself, may be a contributory cause of death [illegible] infectious and may become generally debilitated [illegible] Spontaneous spontaneous cures occasionally occur. Leprosy lasts for [illegible] years. Life [illegible] years, [illegible] years, and the patient may have periods free of disease activity. Leprosy is usually treated with [illegible] drugs, including the [illegible] and [illegible] all in the [illegible].

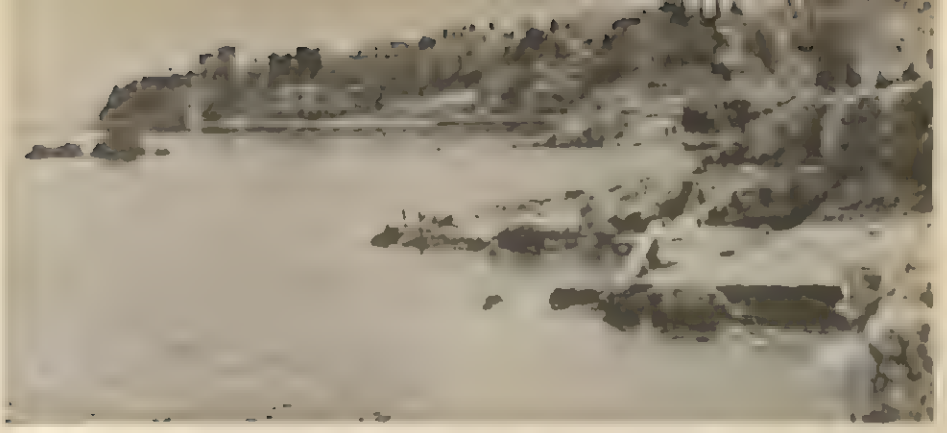
Hospitals for the treatment of Hansen's disease are maintained in several countries, known also as leprosaria. These are supplemented by outpatient services. The U.S. has three such hospitals, at Carville, La., Kalaupapa, Molokai, Hawaii, and in Fort Stanton, N.Mex., near Roswell. The Wheeler or [illegible] the patient is removed from the community depends on whether his condition is in an infectious stage or not.

Lepsius (*lĕp'sē-ŭs*), KARL RICHARD, Egyptologist, born in Naumburg, Germany, Dec. 23, 1810, died in Berlin, July 10, 1884. He obtained a doctor's degree in 1833. The following year, he awarded a prize at Paris for his essay "Palaeography as a Help for Philology." In 1835 he began historical research of Egyptian antiquities, for which purpose he visited Rome, where he met Bunsen, and in 1842 was delegated by King Frederick William IV of Prussia to make explorations in Lower and Upper Egypt. His party assembled in Alexandria in 1842, whence he directed for three years an extensive research of various ruins, monuments, and tombs, from the Sudan north of Khartoum to the coast of Syria. After his return to Berlin, he became professor at the university, but in 1866 visited Egypt a second time to explore the Nile delta, and discovered the Table of Canopus. He became head of the Royal Library in Berlin in 1874. The result of his research in Egypt is the standard work "Monuments of Egypt and Ethiopia" (12 vols., 1849-59). His other books include "Book of the Dead of the Egyptians" (1842) and "Chronology of the Egyptians" (1849).

Lérida (*lĕr'ē-dä*), a town in northeast Spain, capital of the province of the same name. Situated on the Segre, a tributary of the Ebro River, Lérida lies 110 m. w. of Barcelona. It has manufactures of leather, paper, glass, and woolen and cotton cloth. This ancient city dates back to Roman days, when it was called *Ilerda* and its inhabitants *Ilerdenses* or *Ilergetes*. A battle scene from the time of the Punic Wars throughout history, Lérida possesses ancient ruins including a citadel, walls, and a moat. Its Romanesque town hall, built in the 13th century, has been restored. Population, *ca.* 38,000.

Lermontoff (*lyĕr'mŏn-tŏf*), MIKHAIL YURYEVICH, scholar and poet, born in Moscow, Russia, Oct. 15, 1814; died July 15, 1841. He was educated at Moscow and St. Petersburg, became an official in the imperial guard, and in 1837 was sent as an officer of dragoons to the Caucasus. His death resulted from a duel in which he was mortally wounded by a fellow officer. The writings of Lermontoff are among the most [illegible] of Russian poetry. His best known works include "Song of the Czar Ivan Vassilievitch," "A Hero of Our Times," "The Demon," and "The Death of Valerik."

Le Roi Est Mort, Vive le Roi [illegible] "The King is dead; long live the King!" The phrase was used at the occasion of the death of a French king, signifying the succession to the throne and expressing the idea of the continuity of a regular rule in the king. The time of its first use is not known. It



Courtesy Greek Govt. Office of Information, N. Y.

VIEW OF THE ISLAND OF LESBOS

was most often quoted in the 17th and 18th centuries.

Lesage (*lĕ säf'*), ALAIN RENÉ, playwright and novelist, born in Sarzeau, Brittany, France, May 8, 1668; died in Boulogne, Nov. 17, 1747. He was educated by the Jesuits in Vannes and studied for the law, being admitted to the bar in Paris in 1692. Encouraged to write, he produced a number of translations, including one of a "sequel" to Miguel de Cervantes' "Don Quixote." The abbé de Lyonnes introduced Lesage to Spanish literature, gave him access to his own Spanish library, and granted him a pension. In this early period, Lesage translated plays by some of the major Spanish playwrights, among them Lope de Vega Carpio. In 1707 he achieved a measure of success with a one-act play, *"Crispin rival de son maître"*; and in the same year his novel *"Le Diable boiteux"* appeared. Despite the success of his play, however, Lesage was not popular with the actors of the Paris theater, and he was unable to have his next play produced until 1709. This reworked farce, "Turcaret," resembled the comedies of Molière in its realism and satire; it dealt with one of the unpopular figures of the day—the government tax farmer. To provide money for a growing family, Lesage wrote *ca.* 100 short pieces for the French fairs—comic operas and short musical comedies presented at booths as attractions of the fairs produced at carnival time. He also wrote novels, mostly based on Spanish themes.

His major work, the novel "Gil Blas de Santillane," appeared in three parts, in 1715, 1724, and 1735. Ostensibly a Spanish work, it is instead thoroughly French, even Breton, in its characters and settings. Its picaresque hero, *Gil Blas*, is a rogue rather like the *Figaro* of Pierre de Beaumarchais. He plays many roles—robber, servant, confidential agent for a duke, envoy for the king—during his adventures. Throughout the novel, however, he and his servant Scipio and his patron *Don Alphonso* reflect 17th-century French society.

Lesage was a rare combination of comic dramatist and novelist of manners, and his works display lively humor. Often accused of plagiarism, he did use themes and sometimes characters from other works. Nevertheless, he showed a real genius in recasting such materials into something new and entirely his own. Moreover, in "Gil Blas" he made a major contribution to the development of the novel.

Lesbianism (*lĕz'bĭ-ən-ĭzəm*), in medicine, unnatural sexual desire of a woman for one of her own sex. The name is derived from the Greek island of Lesbos (*q.v.*), home of the Greek poetess, Sappho (6th century B.C.), believed to have enjoyed such female relationship.

Lesbos (*lĕz'bŏs*), or MYTILENE, an island in the Aegean Sea, a department of Greece. It is situated near the coast of Asia Minor, has a triangular form, and includes a total of 675 sq. m. The surface is generally mountainous, but there are large tracts of fertile coast and valley lands. Among the chief products are pine timber, livestock, cereals, and tropical fruits. Aeolian colonists settled the island at an early period and built cities upon it. The poets and literary men of Lesbos included Sappho, Theophrastus, Arion, Pittacus, and several others famous in the history of Greece. In 1462 it became a possession of Turkey, which retained it until 1913. The majority of the inhabitants are Greek. Population, *ca.* 175,000.

Lescaze (*lĕ'skäz*), WILLIAM, architect, born in Geneva, Switzerland, Mar. 27, 1896. He worked in the devastated areas of France during 1919 and 1920 and then came to the U.S. After working in Cleveland for three years, he went to New York and established his own business (1923). He became a partner in the firm of Howe & Lescaze of New York and Philadelphia (1929), but returned to his own firm five years later. Lescaze is famous as the designer of the first air conditioned skyscraper in the U.S., the Philadelphia Savings Fund Society Building in Philadelphia (1932), and as the architect of the first modern residence to use glass brick (1933). Among

his other well-known designs are the Williamsburg Houses (a low-cost housing project in Brooklyn, N.Y.), the Aviation Building and Pavilion of the New York World's Fair (1939-40), the Longfellow Building in Washington, D.C., and the theater, studios, and offices of the Columbia Broadcasting System in Hollywood. Lescaze is also the author of: "Architecture for the New Theater" (1935), "The Intent of the Artist" (1941), and "On Being an Architect" (1942).

Leschetizky (*lĕsh-ę-tĭts'kȳ*), THEODOR, pianist and composer, born near Lemberg, Austrian Poland, June 22, 1830; died in Dresden, Nov. 14, 1915. He studied piano with Karl Czerny and composition with Simon Sechter, and at 12, made a tour as a piano virtuoso. By the time he was 15, he himself had become a teacher and later achieved world-wide fame as an instructor of great pianists at St. Petersburg (1852-70) and Vienna (1870-1915); among his noted pupils were Ossip Gabrilowitsch and Ignace Paderewski. Leschetizky also distinguished himself as the composer of operas and numerous piano selections.

Lesina (*lĕz'ē-nä*), an island in the Adriatic Sea, near Dalmatia, belonging to Yugoslavia. It is 13 m. long and has an undulating surface. The principal town is Lesina, which has a good harbor, and exports fruits and cereal products. Population, *ca.* 20,000.

Leslie (*lĕz'lĭ*), CHARLES ROBERT, painter, born in London, England, Oct. 19, 1794; died there May 5, 1859. He was descended from American parents and settled with them at Philadelphia in 1799, where he was educated and engaged as bookseller. Later he pursued private study in art, but in 1811 went to London, where he entered the Royal Acad., and subsequently formed the friendship of Coleridge, Washington Irving, West, and Allston. After completing his studies and engaging largely in the painting of portraits and historic scenery, he returned to America. From 1833 to 1834, he was teacher of drawing at the West Point Military Acad. He returned to England (1834), where he continued to reside until his death. His best-known productions include: "May-Day in the Time of Queen Elizabeth," "Sancho Panza and the Duchess," and scenes from the writings of Le Sage, Swift, Shakespeare, Cervantes, Molière, and Sterne.

Leslie, FRANK, publisher, born Henry Carter at Ipswich, England, in 1821; died in 1880. After writing for the *Illustrated London News* under the pseudonym which he took as his legal name in 1857, Leslie came to the U.S. (1848) and founded *Frank Leslie's Ladies' Gazette of Paris, London, and New York Fashions* and the *New York Journal* (1859). A year later he began publication of Frank Leslie's *Illustrated Newspaper* and subsequently added to his list a number of other magazines for people in every walk of life. Popular as his magazines were, Leslie died bankrupt because of his own extravagance, and his publishing ventures were saved only through the business acumen of his wife, Miriam Florence Folline (later Baroness de Bazus, *ca.* 1836-1914).

Les Misérables (*lā mē-zā-rā'bl*), most famous novel by the great French poet, dramatist, and novelist, Victor Hugo (1802-85). Leader of the Romantic school in France, Hugo devoted this masterpiece, published in 1862, to the theme of life among the poorer classes.

Lesseps (*lā-sĕps'*), FERDINAND DE, VISCOUNT, diplomatist and engineer, born in Versailles, France, Nov. 19, 1805; died Dec. 7, 1894. After obtaining a liberal education, he was sent for diplomatic service to Lisbon in 1839, and subsequently held similar positions at Barcelona, Tunis, and Alexandria. He was detained in quarantine at Port Said in 1841 and while there conceived the utility of the Suez Canal, which he began to agitate in 1856 by publishing outlines of the proposed course across the Isthmus of Suez. The Viceroy of Egypt granted a charter, but the project was delayed by the active opposition of various nations, particularly England, but De Lesseps succeeded in securing the necessary encouragement and capital, and the canal was formally opened to traffic on Nov. 17, 1869.

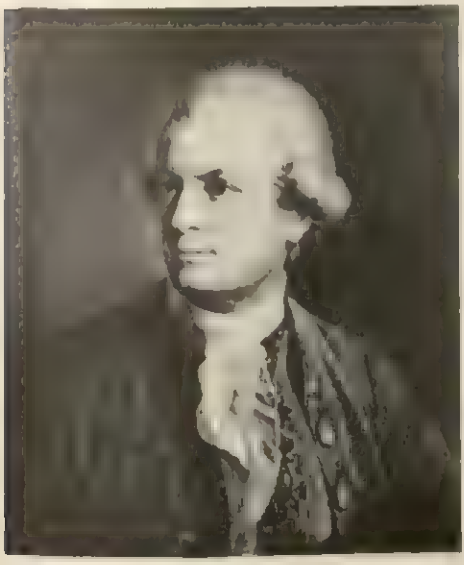
FERDINAND DE LESSEPS

In 1873 De Lesseps began the agitation in favor of a canal across the Isthmus of Panama, and in 1876 formed a company to promote the enterprise. The Colombian government granted exclusive privilege to the company in 1879 and active work began in the latter part of 1881. It was estimated that the canal would cost $120,000,000, but, after $280,000,000 had been spent, only a small portion of the necessary excavation had been effected and the company was dissolved in 1889.

Charges of fraud were later brought against the company by the government and several officers were sentenced to imprisonment, but in the case of De Lesseps the sentence was suspended.

Lesser Antilles (*lĕs'ĕr ăn-tĭl'ēz*). See *Leeward Islands; Windward Islands.*

Lessing (*lĕs'sing*), GOTTHOLD EPHRAIM, scholar, dramatist, and critic, born in Camenz, Germany, Jan. 22, 1729; died in Brunswick, Feb. 15, 1781. His father, a minister of the Orthodox Lutheran school, sent him first to the school of St. Afra, in Meissen, later to the Univ. of Leipzig, where he began a theological course. Soon afterward he developed an interest in literary research, gave up theology, and subsequently settled in Berlin where he became literary critic to the *Vossische Zeitung,* and founded, together with the philosopher Moses Mendelssohn, the journal *Briefe die neueste Literatur betreffend* (*Letters Concerning the Latest Literature,* 1759-67). As secretary to Gen. Tauentzien, in Breslau, he wrote the German classic comedy "Minna von Barnhelm" (published 1767). In 1767 he was appointed dramaturgist of the German National Theater, in Hamburg, and from 1770 until his death was librarian to the Duke of Brunswick in Wolfenbüttel. His other works include the tragedies "Miss Sara Sampson," "Philotas," "Emilia Galotti," and also



GOTTHOLD EPHRAIM LESSING

"Nathan der Weise" (1779), dealing with tolerance for mankind. Among his critical treatises the fundamental "Laokoön" (1766) defined the limits of painting and poetry, and the *"Hamburgische Dramaturgie"* (1767-68) fought against the French concept of drama, teaching Germans the importance of Greek tragedy and of Shakespeare.

L'état, c'est moi (*lā-tä' sā mwä*), French meaning "I am the State," said to have been the expressed motto of the French King Louis XIV (*q.v.*). While some historians have attributed to him this statement of all-embracing power, others maintain that he never made such a declaration.

Lethal Chamber (*lē'thăl chām'bĕr*), an airtight room into which deadly gases are introduced for the painless destruction of animals. Some states, namely, Arizona, California, Colorado, Missouri, Nevada, North Carolina, Oregon, and Wyoming, use the lethal chamber to inflict capital punishment.

Lethargy (*lĕth'ĕr-jĭ*), a state of continued drowsiness; also sluggishness or dullness. In pathology, the term means a profound sleep from which the patient can be only temporarily aroused. Negro or African lethargy is now known as "sleeping sickness" (*q.v.*).

Lethbridge (*lĕth'brĭj*), a city of Alberta, Canada, 145 m. S.E. of Calgary, on the Belly River and on the Canadian Pacific and other railroads. It is in a farming and coal mining section. It has flour mills, machine shops, iron foundries, bakeries, grain elevators, and sawmills. It was settled in 1885 and incorporated in 1890. Population, 1946, 16,522.

Lethe (*lē'thē*), a stream mentioned in Greek mythology, which flowed gently and silently in a secluded vale of Elysium. The waters of the Lethe had the property of dispelling care and producing utter forgetfulness of former events. The Pythagorean doctrine of the transmigration of souls implied that after deceased mortals had inhabited Elysium a thousand years they were destined to animate other bodies on earth, and, before leaving Elysium, they drank of the waters of the River Lethe in order that they could enter upon their new career without any remembrance of the past.

Letter (*lĕt'ĕr*), an alphabetical character used to designate speech sounds; also a written message or communication of either personal or official nature. In the plural, the word may denote literature, general culture, or the profession of literature, as "man of letters." A letter is commonly understood to be a written communication sent by one person or group to another. Outstanding men throughout the centuries, in every country, have been well versed in the art of letter writing, and today these writings constitute a valuable part of our literary and historical heritage.

Letters of Administration are granted by a court to show that the power and duties of an executor or administrator have been delegated to the person named in these papers. In the case of a person dying without appointing an executor, the court may grant a letter of administration to the widow, or a relative, or even a

creditor of the deceased, who then becomes administrator of the property of the deceased.

Letters of Marque and Reprisal (*märk, rē-prīz'al*), a license or commission issued by a state or government authorizing the bearer to pass beyond the boundaries of his own country for the purpose of capturing prizes of the enemy, consisting of their persons or goods. The term *letters of marque* signifies a license from the government to pass beyond the limits or jurisdiction of one's own country. *Reprisal* signifies taking in turn

Letts (*lĕts*), general name for a people inhabiting portions of Europe, largely in Latvia, Estonia, Lithuania, and Russia. In language they are closely allied to the Lithuanians, but have a distinct literature. In 1586 the Lutheran Catechism was translated into the Lettic languages.

Lettuce (*lĕt'tĭs*), an annual plant of the order *Compositae,* cultivated in gardens as a salad. Many species are grown, most of which attain a height of 2 ft., bear yellowish flowers, and have variously formed leaves. The plant is in its best state when from 4 to 6 in. tall, when it is tender and best adapted as a food. Lettuce has been cultivated in gardens since very early times, but does not grow spontaneously in any country. It includes both greenish and purplish species. Some have heads resembling those found in several kinds of cabbage.

Leucadia (*lū-eā'dĭ-a*), or SANTA MAURA, an island off the west coast of Greece, in the Ionian Sea. The area is 109 sq. m. It is traversed by hills, but contains a fair proportion of fertile soil, and produces cereals, fruits, and wine. In the southern part is a line of white cliffs, the highest of which is about 2,000 ft., known as the Leucadian Rock, or the Lover's Leap, so called because despairing lovers threw themselves from it. Amaxichi is the chief town. Most of the inhabitants are Greeks. Population, *ca.* 35,000.

Leuctra (*lūk'tra*), a village of Greece, in Boeotia. It is famous as the place where the Thebans under Epaminondas defeated the Spartans under Cleombrotus, in 371 B.C.

Leukemia (*lū-kē'mi-a*), a disease of the blood and blood-forming organs such as the bone marrow and the spleen. It is of unknown cause, but is sometimes considered as a kind of blood cancer. It is characterized by a greatly increased number of white blood cells. There are several varieties of the disease, each determined by the predominant type of blood cell. Alternate lessening and increase of symptoms are not uncommon, with death frequently resulting from anemia, debility, or infection. For certain types, iron and vitamins, blood transfusions, and X-ray therapy are helpful in relieving symptoms. No proven specific cure is generally known.

Leukocyte (*lū'kō-sīt*), in physiology, white or uncolored nucleated cells in the blood (*q.v.*). They are also found in areas in the tissue where inflammation or infection is present.

Leukorrhea (*lū'kō-rē-a*), in medicine, a discharge from the vagina, white or tinged with yellow or green. It is usually caused by inflammation of the mucous membrane.

Leuthen (*loi'tẹn*), a small town in Lower Silesia, Germany, celebrated on account of a battle fought there on Dec. 5, 1757, by which Prussia recovered most of Silesia. The Prussian army consisted of 35,000 men under Frederick the Great, while 90,000 Austrians were under Prince Charles of Lorraine, but the former won a decisive victory.

Leutze (*loit'sẹ*), EMANUEL, painter, born in Gemünd, in Württemberg, Germany, May 24, 1816; died in Washington, D.C., July 18, 1868. As a child in Philadelphia, he attended school and developed skill in elementary drawing. He completed his first painting in 1840 ("An Indian Gazing at the Setting Sun"), and the following year returned to Germany, where he studied at Düsseldorf. In 1859 he returned to America and later produced many historical paintings. He was made a member of the National Acad. in 1860, won a prize at the Brussels art exhibition, and painted a fine picture for the staircase of the Washington Capitol, entitled "Westward Ho." His "Washington Crossing the Delaware," now in the Metropolitan Museum of Art, in New York, is considered a famous American painting.

Levant (*lē-vănt'*), an Italian term meaning the East. It is applied in a restricted sense to the Asiatic coast of the Mediterranean, from Constantinople to Alexandria, Egypt, but in a more general sense to the regions from Italy to the Euphrates and the Nile.

Levasseur (*lẹ-vä-sēr'*), EMILE, economist, born in Paris, France, Dec. 8, 1828; died in July 1911. He studied in the Coll. Bourbon and became a professor in the lycée at Alençon. In 1872 he was appointed professor in the Coll. of France, where he promoted several international congresses for the discussion of geographical and statistical topics. In 1893 he visited the U.S. and attended the Columbian Exposition at Chicago. His writings are chiefly devoted to statistics and political economy.

Levee (*lĕv'ē*), an artificial embankment constructed along the edge of a river to prevent the water from leaving its channel. As the current of a large river descends, it loses velocity, and sediment is deposited in the river bed. Without the safeguard of a levee, the water overflows its shallower channel into the surrounding country, often causing much damage to homes and farmlands. The most important levees of this country are those of the lower Mississippi which border the river for a distance of 1,200 miles, chiefly from

Courtesy Culver Service, N. Y.

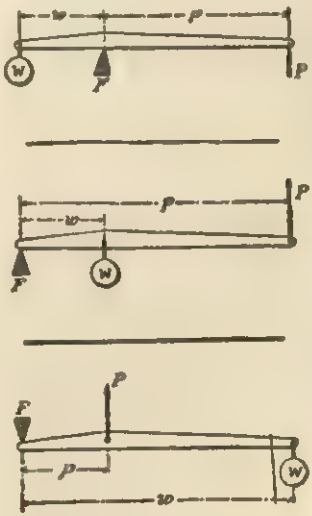
NEW ORLEANS LEVEE IN THE 1880's

Cairo, Ill., to the Gulf of Mexico. Other levees of vast extent are those of the Ganges River in India, the Po River in Italy, and those in the lowlands of Holland, known as dikes (*q.v.*). A leak or break in a levee brings a dangerous onrush of a great volume of water; years are often necessary to reclaim land destroyed in this manner. In the southern part of the U.S. a levee may also mean a river quay or landing station.

The term levee was formerly used to designate a reception or assembly held in the morning or early afternoon by a king or royal personage. Usually, the levee was only attended by men. In 17th-century France, levees were conducted with rigid and elaborate ceremony. Individuals of high rank were admitted to the *"petit lever"* when the king rose from his bed, and lesser personages were allowed as the morning progressed and the king was finally dressed. For a short time in the 19th century, the term levee was also applied to public receptions held by the President of the U.S.

Level (*lĕv'ĕl*), an instrument for indicating a horizontal line. It may be of various forms or shapes for specific uses. The surveyor's level usually consists of a telescope with a spirit level (a bubble of air floating in a fluid contained in a glass tube) attached, so mounted that it can be revolved about the head of a tripod. By sighting through the leveled telescope, contour lines can be determined. The mechanic's bench level is made from wood or metal, inside of which is a glass tube containing a drop of mercury. When the bar is placed on a level surface, the drop of mercury moves into the exact center of the tube. The railroad track level, to insure level tracks, is similar though made of iron. Where a condition of levelness is required, many special pieces of apparatus have levels built into them, as do certain cameras used for precision work. Levelness indicates a position at right angles to the force of gravity, which may be visualized as lines of force from the leveled object to the center of the earth.

Lever (*lĕ'vĕr*), an inflexible bar or rod moving upon a fixed point called the *fulcrum* or *prop*, and having the *weight* to be moved and the *power* to move it applied at two other points. The lever is one of the mechanical powers. It includes three classes, being numbered according to the relative positions of the fulcrum, the points of application, and the force of the weights.



THREE CLASSES OF LEVERS

In levers of the *first class* the fulcrum is between the weight and the power, as in a pump handle, in which the hand is the power, and water lifted is the weight, and the pivot is the fulcrum. Levers of the *second class* have the weight between the fulcrum

and the power, as an oar, in which the hand is the power, the boat is the weight, and the water is the fulcrum. In levers of the *third class* the power is applied between the fulcrum and the weight, as in the treadle of some grindstones, in which the front end resting on the ground is the fulcrum, the foot is the power, and the force is transmitted by the rod to the weight, the wheel above. In the lever advantage is gained mainly at a loss of time, that is, a heavy weight may be lifted by a small power passing through a greater distance.

In the lever, the weight times the distance between the weight and the fulcrum is equal to the force-applied times the distance between this force and the fulcrum. Thus, in order to move a heavy weight with a small force, the distance between the force and the fulcrum must be much greater than the distance between the weight and the fulcrum.

The principle of the lever was known as far back in recorded history as 4000 B.C., when it was employed by the Babylonians, Chaldeans, and Egyptians.

Lever, CHARLES JAMES, novelist, born in Dublin, Ireland, Aug. 31, 1806; died in Trieste, Austria, June 1, 1872. In 1827 he was graduated from Trinity Coll., studied medicine at Göttingen, Germany, and returned to practice medicine in Ireland. His first production was "Charles O'Malley," a novel of Irish college life. In 1832 he visited America, making a study of Indian life, and soon after contributed to the *Dublin Univ. Magazine,* becoming its editor in 1842. In 1845 he held a diplomatic position at Florence, became vice consul at Spezia in 1858, and was appointed to a like position at Trieste in 1857. Among his writings are: "Tom Burke of Ours," "Con Cregan," "The Dodd Family Abroad," and "St. Patrick's Eve."

Leverrier (*lę-vĕ-ryā'*), URBAIN JEAN JOSEPH, noted astronomer, born at St.-Lô, France, Mar. 11, 1811; died at Paris, Sept. 23, 1877. After obtaining the necessary training, he was admitted to the École Polytechnique in 1831, and subsequently received an appointment as an engineer in connection with the tobacco board, a commission to supervise the manufacture and sale of tobacco. In 1837 he became a teacher of astronomy at the École Polytechnique, and while there made searching study of astronomical phenomena. Accounts on the transit of Mercury (1845) secured him admission to the Acad. of Science the following year. In connection with studies and calculations concerning the planet Uranus, he calculated the existence of another star, then unknown. He defined the location of that planet exactly, and communicated with the German astronomer, Johann Gottfried Galle (1812-1910), who was able to observe this celestial phenomenon in exact accordance with Leverrier's calculations. Thus, the planet Neptune was discovered in 1846. For this he received the Grand Cross of the Legion of Honor and a professorship in the faculty of sciences at Paris. In 1841 he was elected a member of the general assembly, became senator in 1852, and was director of the observatory of Paris from 1854 until the time of his death, except the three years from 1870 until 1873.

Levi (*lē'vī*), the third son of Jacob and Leah. He is conspicuous in Jewish history on account of joining his brother Simeon in the massacre of the inhabitants of Shechem, for which Jacob pronounced the curse that they should be scattered among Israel. No territory was given to the Levites, who were set apart for the priestly office, enjoying privileges and dignities above the other tribes. The house of Levi was divided into three families, as descendants from Levi's sons, Gershon, Kohath, and Merari. This tribe included Moses and Aaron. In the time of David the Levites numbered 38,000.

Lévis (*lā-vē'*), or POINT LEVI, capital of Lévis County, Quebec, on the St. Lawrence River, opposite the city of Quebec. It is on the Canadian National and the Quebec Central railways, has extensive docks, and is connected with Quebec by one of the largest cantilever bridges in the world. Among the manufactures are woolen goods, boots and shoes, fertilizer, machinery, and soap. The place was settled in 1647 and incorporated in 1861. Population, *ca.* 12,000.

Levites (*lē'vīts*), the descendants of Levi, son of the patriarch Jacob. According to Jacob's last will, they did not get territorial properties in Palestine, but only the right to live in 48 Palestine cities. They were entitled to serve at the sanctuary as custodians, assistants to priests, or musicians, but the office of priesthood was reserved to Aaron, the great-grandson of Levi, and to Aaron's sons.

Leviticus (*lē-vĭt'ĭ-kŭs*), the third book of the Old Testament. It contains the laws and regulations concerning the Levites and the ceremonials of worship. The offering of sacrifices, the distinction of things clean and unclean, the consecration and authority of priests, the feast of atonement, the sabbatical and jubilee years, and the prohibition of theft, perjury, and idolatry are treated in the book.

Levulose (*lĕv'ū-lōs*). See *Fructose.*

Levy (*lĕv'ȳ*), URIAH PHILLIPS, American naval officer, born in Philadelphia, Pa., in 1792; died in 1862. He was flag officer of the Mediterranean Squadron in 1860. Purchasing Jefferson's home "Monticello," he left it to the U.S., but a contested will nullified the bequest. His son, *Jefferson Monroe Levy,* who died in 1923, sponsored banking legislation in Congress, and raised the wages of post-office clerks. He inherited historic "Mon-

ticello" and preserved it for the nation.

Lévy-Bruhl (*lā'vē-brül*), LUCIEN, philosopher, born in Paris, France, Apr. 10, 1857; died in 1939. An exponent of sociological philosophy, Lévy-Bruhl was one of the most distinguished members of the faculty of the Sorbonne (1899-1927), and was elected (1918) a member of the Académie des Sciences Morals et Politiques. He was the author of: *"L'Idée de Responsabilité"* (1884), *"La Philosophie d'Auguste Comte"* (1900), *"La Mentalité Primitive"* (1922), and other books.

Lewes (*lū'is*), GEORGE HENRY, author, born in London, England, Apr. 18, 1817; died Nov. 30, 1878. He studied philosophy and psychology in England and Germany and took up his residence in London. In 1854 he became associated with Marian Evans (George Eliot), with whom he lived as common-law husband. His writings include: "Life of Goethe," "History of Philosophy," "Physiology of Common Life," "On Actors and the Art of Acting," "Comte's Philosophy of the Sciences," and "Biographical History of Philosophy from Thales to Comte."

Lewis (*lū'is*), CHARLES B., author, born in Ohio in 1842; died Aug. 21, 1924. He was graduated from the Michigan Agricultural Coll. and worked for the Detroit *Free Press*, in which he published humorous and descriptive sketches under the pen name of *M. Quad*. He later settled in Brooklyn, N.Y., and devoted his attention to book and magazine work. Besides publishing a number of plays, he wrote: "The Lime-Kiln Club," "Field, Fort, and Fleet," "Sawed-off Sketches," "Mr. and Mrs. Bowser," and "Quad's Odds."

Lewis, ISAAC NEWTON, soldier and inventor, born in New Salem, Pa., Oct. 12, 1858; died Nov. 9, 1931. A graduate of the U.S. Military Acad. at West Point (1884), Lewis attained the rank of colonel in the U.S. Army in 1913, the year of his retirement from the service. His many inventions added to the efficiency of U.S. military equipment. He instituted a reorganization of the U.S. Army artillery corps (1902). He invented the Lewis machine gun (1911), a code of signals for artillery fire control, a gas-propelled torpedo, an artillery position-finder, windmill electric-lighting systems, an automatic sight, and many other important military devices.

Lewis, JOHN LLEWELLYN, labor leader, born in Lucas, Ia., Feb. 12, 1880. As a young coal miner, Lewis joined the United Mine Workers (*q.v.*) union (then an affiliate of the American Federation of Labor), of which he eventually became vice president (1917) and president (1920). He also became increasingly important in the A.F. of L., acting for six years in the capacity of organizer (1911-17), and working to secure the election of William Green as its president, after the death of Samuel Gompers (*q.v.*). In the dispute over industrial *vs.* craft unions, Lewis left the A.F.L.,

JOHN L. LEWIS

and the U.M.W. joined in the formation of a rival organization, which later became the Congress of Industrial Organizations (*q.v.*). Lewis served as the president of the new organization from 1935 to 1941, when he withdrew his U.M.W. He continued as president of the U.M.W., and the Mine Workers temporarily rejoined the A.F.L. in 1946-47 but have since retained an independent status. After World War II the U.M.W. was involved in several strikes which contributed to passage of the Taft-Hartley Act (see *National Labor Relations Act*). Lewis retired from the presidency in 1960.

Lewis Theory. See *Chemistry*.

Lewis, MARY SYBIL (MRS. ROBERT L. HAGUE), operatic singer, born at Hot Springs, Ark., Jan. 7, 1900. She sang in the "Ziegfeld Follies" in New York and later appeared in Vienna, London, and Paris. From 1926 she appeared at the Metropolitan Opera House, N.Y., for four seasons. In 1927 she was a guest artist at the Berlin Opera House. She retired from the stage in 1931. She died Dec. 31, 1941.

Lewis, MERIWETHER, explorer, born near Charlottesville, Va., Aug. 18, 1774; killed himself near Nashville, Tenn., Oct. 11, 1809. He and Capt. William Clark were appointed to conduct an exploring expedition to the northwestern portion of the U.S. In the latter part of 1803 they set out with a company of 28 men, wintered at the mouth of the Missouri River, and in the following spring began the ascent of the Missouri in boats.

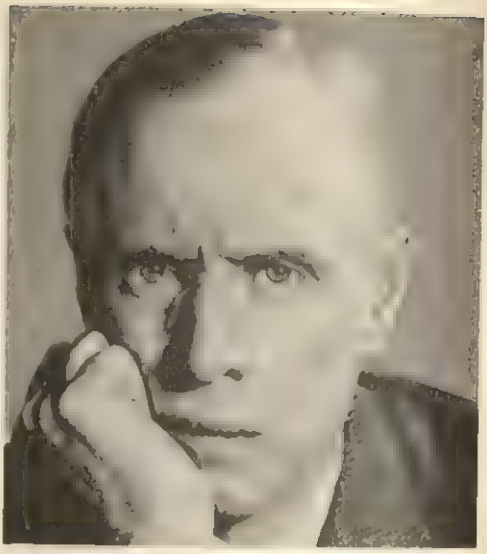
The second winter was passed at 47° 21′ north lat. among the Mandan Indians, near the present site of Mandan, N.D., and in the spring of 1805 they continued the exploration of the Missouri, which they followed from the confluence of the Milk River to Red Rock Lake, in the southwestern part of Montana. Procuring horses and a guide from the Shoshone Indians, they crossed the mountains westward, and in October reached a tributary of the Columbia, which they descended

in canoes, and on Nov. 15 reached the mouth of the Columbia.

In the spring they started on a return tour, reaching the Missouri in the summer and the Mississippi in September 1806. After they reached Washington, D.C., extensive reports were published of the expedition and its results, which gave the people of America a clear idea of the vastness of the Louisiana Purchase. The members of the expedition were liberally rewarded by grants of land. Lewis was made governor of Missouri Territory, in which position he served until 1809, when his mind became weakened as a result of the change from his former activities. This change was the direct cause of his death. His travels are recounted in Jefferson's "Message from the President of the U.S., Communicating the Discoveries Made in Exploring the Missouri, the Red River and the Washita," Coues' "History of the Expedition Under Lewis and Clark," and Brooks' "First Across the Continent."

Lewis, SINCLAIR, novelist, born in Sauk Center, Minn., Feb. 7, 1885; died near Rome, Italy, Jan. 10, 1951. His father was a country doctor whose Welsh ancestors had lived in New York and Connecticut for generations. While attending Yale Univ., where he edited a literary magazine, he became interested in Socialism. As a consequence, he left college to do free-lance writing in New York. He later went to Panama by steerage to work on the construction of the canal. Returning, he was graduated from Yale (1908) and traveled for two years through the U.S. During this period, he worked on newspapers in New Haven, Conn., Waterloo, Ia., and San Francisco, Cal. While in California, he acted as ghost-writer for Jack London, and was discharged from the Associated Press for incompetence. Eventually he returned to New York, where he was employed successively as a manuscript reader, as assistant editor of *Adventure*, and as editor for the George H. Doran Publishing Co. He retained this position until 1916, at which time he felt that he was capable of earning his living as a writer. He had married Grace Hegger in 1914; they were divorced in 1925. Their son, Wells, died in service during World War II. In 1926, Lewis rejected the Pulitzer Prize for his novel, "Arrowsmith." In 1930, however, he accepted the Nobel Prize for literature. He was the first American to be accorded this distinction. He toured as an actor, in 1938 and 1939, playing in his own comedy, "Angela is Twenty-two." In 1942, he was divorced by Dorothy Thompson, the political columnist, whom he had married in 1928. During his later years, Lewis interrupted his writing to lecture at the Univ. of Minnesota and elsewhere.

His early works were mere story-telling: "Our Mr. Wren" (1914), "The Trail of the Hawk" (1915), "The Job" (1917), "The Innocents" (1917), "Free Air" (1919), and a play "Hobohemia" (1919). Then, in the early twenties, his major works appeared: "Main Street" (1920) and "Babbitt" (1922). In these novels he was revealed as a satirist of the American middle class. Working from a basis of minute observation, he exaggerated his material for purposes of caricature. It was this very desire for accuracy, however, together with a lack of self-criticism, which often produced pages of dull cataloguing, and perhaps hindered him from probing beneath the surface of his material. He seldom allowed the reader to glimpse any level of society except the world of Babbittry with which he seemed obsessed. As a consequence, his excellence lay almost exclusively in the caricature of one aspect of American life. Moreover, writing too prolifically, and thus exhausting reader interest in his formula, he at the same time permitted it to master him, so that often his satire declined into querulous sarcasm.



SINCLAIR LEWIS

Traces of these qualities may be seen even in novels as early as "Arrowsmith" (1925), "Mantrap" (1926), "Elmer Gantry" (1927), and "The Man Who Knew Coolidge" (1928). "Dodsworth" (1929) represented a valiant attempt to recover his earlier powers. Subsequent works include "Ann Vickers" (1933); "Work of Art" (1934); a play, "Jayhawker" (1934); "It Can't Happen Here" (1935), an attack on fascism, which was also adapted for the stage; "The Prodigal Parents" (1938); "Bethel Meriday" (1940); "Gideon Planish" (1943); "Cass Timberlane" (1945); "Kingsblood Royal" (1947); "The God Seeker" (1949); and "World So Wide" (1951). Granting Lewis' limitations and the gradual decline of his powers, we must at the same time recognize that, within his own sphere, and in his best works, his gifts as a satirist are unparalleled in American literature.

Lewis and Clark Exposition, an international exposition held at Portland, Ore., to celebrate the centennial of the exploration of the Oregon country by Lewis and Clark. The gates were opened June 1, 1905, and closed Oct. 15, 1905, a period of 137 days. The large receipts made it a financial success. Official reports place the attendance at 2,545,509.

Lewisohn (*lū'is-ŭn*), ADOLPH, capitalist, born in Hamburg, Germany, in 1849; died Aug. 17, 1938. Lewisohn came to the U.S. before he was 20 and went into business. In time he came into industrial prominence as president of the United Metals Selling Co. and the General Development Co. and vice president of the Utah Consolidated Mining Co. He made substantial gifts to Columbia, Harvard, Princeton, and Yale universities; to the City Coll. of New York, he donated Lewisohn Stadium in uptown Manhattan.

Lewisohn, LUDWIG, author, born in Berlin, Germany, May 30, 1883; died in Miami, Fla., Dec. 31, 1955. He was brought to the U.S. in 1890. He began his career as an editor for Doubleday, Page & Co., taught German at the Univ. of Wisconsin (1910-11) and Ohio State Univ. (1911-19), and was an editor of the *Nation* (1919-24). He lived in France from 1927 until late in the 1930's. His outstanding work was as a literary critic, but he is also known for his novels. Two sensitive autobiographical novels, "Upstream" (1922) and "Midchannel" (1929), attempted to relate the modern Jew to his surroundings. His other works include "Expression in America" (1932), "For Ever Wilt Thou Love" (1939), "The Case of Mr. Crump" (1947), "Anniversary" (1948), a two-volume biography of Goethe (1949), the novel "In a Summer Season" (1955), and translations from the German. He was librarian at Brandeis Univ. at his death.

Lewiston (*lū'is-tŭn*), county seat of Nez Perce County, Idaho, on the Snake and Clearwater rivers, 110 m. S.E. of Spokane, Wash. It is on the Union Pacific and the Northern Pacific R.R.'s and is surrounded by a productive agricultural and mining country. The chief industry is lumbering, and there are many diversified manufactures and trade in livestock, fruit, and merchandise. Lewiston is the seat of the Northern Idaho Teachers Coll. A steel bridge connects it with Clarkston, Wash., on the other side of the Snake River. The town was incorporated in 1863. Population, 1950, 12,985.

Lewiston, a city in Androscoggin County, Maine, on the Androscoggin River, opposite Auburn, 35 m. N. of Portland. It is on the Maine Central and the Grand Trunk R.R.'s. The noteworthy buildings include the town hall, the public library, and Bates Coll. The last-named institution was founded in 1863 and endowed by Benjamin E. Bates and others. The river has a fall of about 50 ft., providing immense water power. The manufactures include cotton and woolen goods, leather products, belts, hats, brooms, and utensils. The surrounding country is agricultural, giving the city an important trade in cereals and livestock. It was settled in 1770, when it became known as the Plantation of Lewiston, and was incorporated in 1795. Population, 1950, 40,974.

Lewiston, a village in Niagara County, New York, on the Niagara River and the New York Central R.R. It is the terminus of navigation on Lake Ontario and is visited regularly by steamers from Toronto. It is visited by tourists during the summer months. The French located a blockhouse on its site in 1720. In 1814 it was occupied by the Americans under Gen. Riall, who was defeated by a force of British and Indians under Col. Tucker, and the place was burned. Population, 1940, 1,280; in 1950, 1,626.

Lexicon (*lĕks'i-kŏn*), a reference book or vocabulary. The name of such a book is taken from the Greek (*lexikos,* meaning "of or belonging to words"). Lexicons are usually arranged in alphabetical order and are made up of articles defining meanings and tracing the etymologies of words in a given language. The name is also used as a synonym for dictionary or encyclopedia (*qq.v.*); German works of the latter type, for instance, include *"Brockhaus Konversations Lexikon"* and *"Knaurs Lexikon A-Z."*

Lexington (*lĕks'ĭng-tŭn*), county seat of Fayette County, Kentucky, 20 m. S.E. of Frankfort. It is on the Southern, the Chesapeake & Ohio, the Louisville & Nashville, and other railroads. The city is situated in the celebrated blue grass region, and is the center of a large commercial trade. Among the noteworthy buildings are Hamilton Coll., Transylvania Coll., Sayre Coll., St. Catherine's Acad., the State Agricultural and Mechanical Coll., the Kentucky Reform School, and the Univ. of Kentucky. The manufactures include cordage, flour, copper products, hemp and cotton goods, clothing, medicines, and machinery. It has a large trade in groceries, leaf tobacco, cereals, and hardware. There is a fine monument to Henry Clay. First settled in 1779, Lexington was incorporated in 1782 and was the capital of Kentucky, 1792-93. Population, 1950, 55,534.

Lexington, a town of Middlesex County, Massachusetts, 10 m. N.W. of Boston, on the Boston & Maine R.R. It is celebrated as the site of the first battle of the Revolution, which occurred here Apr. 19, 1775. The British had secretly dispatched a force from Boston to seize the military stores collected at Concord; news of this raid was spread by Paul Revere. Accordingly, the call to arms was sounded and the militia was armed. When Major Pitcairn reached the village with British troops he found minutemen drawn up on the green. Finding that they refused to disperse at his com-

BATTLE OF LEXINGTON

Engraving by John Baker (flourished in the 1830's)

mand, he promptly ordered his men to charge, but the militia held its ground until the British were reinforced, when they fell back and Major Pitcairn moved on to Concord. On returning from Concord, the British were attacked at Lexington and pursued by a galling fire from all sides. Exhausted by their march of 18 miles and their fast of 14 hours, the British fell into a disorderly flight and would probably have been destroyed if Lord Percy had not come forward with heavy reinforcements from Boston. The British lost 273 men, the Americans lost 93. This engagement so aroused the colonists that within a week 16,000 men were besieging Gen. Gage in Boston. Lexington contains a monument erected in 1799 to commemorate the battle. Population, 1950, 17,335; in 1960, 27,691.

Lexington, city in western Missouri, seat of Lafayette County, on the Missouri River, 40 m. E. of Kansas City. It is on the Missouri Pacific R.R. The city is located in a rich farming area which produces grain, fruit, and livestock. There are also coal mines and rock quarries nearby. Lexington manufactures textiles and clothing, and it has a sawmill. It is the site of the Wentworth Military Acad. The city was first settled in 1822 and incorporated in 1845. During the Civil War, in 1861, it was the scene of a battle between the Federals under Col. J. A. Mulligan and the Missouri State Guard under Gen. Sterling Price. Population, 1940, 5,341; in 1960, 4,845.

Lexington, town in western Virginia, seat of Rockbridge County, on the North River, *ca.* 50 m. N. of Roanoke. It is on the Chesapeake & Ohio R.R. (freight). It is surrounded by fertile agricultural and stock-raising country and is a tourist center. The manufactures include flour, machinery, and ironware. Washington and Lee Univ. (*q.v.*) and Virginia Military Inst. are located here, as are the homes and tombs of Thomas J. ("Stonewall") Jackson and Robert E. Lee (*qq.v.*). The town was settled in 1777. Population, 1940, 3,914; in 1960, 7,537.

Lexow (*lĕk'sou*), CLARENCE, lawyer and politician, born in Brooklyn, N.Y., on Sept. 16, 1852; died in 1910. After studying abroad he was graduated from the Columbia Univ. Law School in 1872, and was admitted to the bar, opening his practice in New York City. His clients, mostly German-American, brought him much important litigation. In 1882 he moved to Nyack, N.Y., becoming active in the Republican party there. He was an unsuccessful Republican candidate for Congress in the election of 1890, but was elected to the state senate in 1893. Almost at once he became an influential member of the state legislature, being named chairman of the committee on internal affairs. He introduced the bipartisan police bill calling for an investigation of the New York City police force, and was appointed chairman of the so-called "Lexow Committee." The investigation conducted by this committee led to the discovery of a system of vice protection by New York police, and the subsequent election of Mayor Strong on a reform platform.

He introduced the legislation creating the city of Greater New York, was chairman of the joint legislative committee for the investigation of trusts and unlawful combinations, of the committee on primary election reforms and of the judiciary committee. In 1896 he was chairman of the committee on resolutions at the Republican state convention, at which time he introduced the gold standard plank into the party's platform. He resigned from the state senate in 1898.

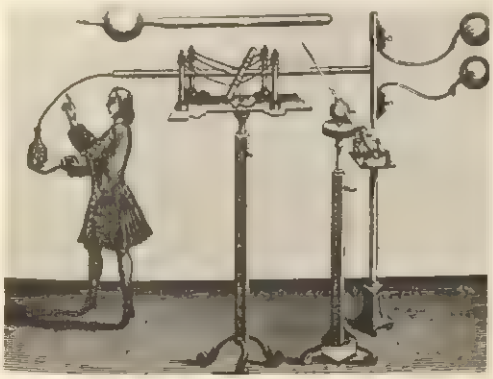
Leyden (*lī'dĕn*) or LEIDEN, a city in south-

western Netherlands, on the Old Rhine River, 22 m. s.w. of Amsterdam. It is the oldest city in The Netherlands. In 1640 it had a population of 100,000 but gradually declined until the beginning of the 19th century. Since then the city has again gained in population and importance. It has manufactures of cotton and woolen goods, earthenware, machinery, soap, perfume, and canned food. The noteworthy buildings include the Church of St. Peter and the Hooglandsche Church. Leyden is the seat of the Univ. of Leyden, founded in 1575 and the oldest in the country. The city is the birthplace of Rembrandt, and it was from here that the Pilgrims, who founded the colony at Plymouth, Mass., sailed in 1620. Population, *ca.* 96,000.

Leyden, LUCAS VAN. See *Lucas Van Leyden.*

Leyden Jar (*lī'dẹn jär*), an electric accumulator devised in 1745 by Musschenbroek of Leyden, Holland, and independently constructed in the same year by E. G. von Kleist, dean of the cathedral of Kammin, Prussia. Its ability to store an electric charge is termed capacitance (*q.v.*); the electrical unit denoting capacitance is the *farad* (after Faraday, *q.v.*). A Leyden jar is a form of condenser (*q.v.*) constructed by coating the inside and outside of a glass jar with tin foil, for about two-thirds of the height. The inside coating is connected with a metallic rod having a brass knob at the top. To charge the jar the knob is brought near the conductor of a static machine, and a number of sparks are passed into the jar. The inside coating is charged positively and the outside negatively, and, if one hand is placed on the outer coating and the other on the knob, a discharge passes through the body and gives a more or less severe shock. Before modern means of generating electric current, Leyden jars, or modifications, were used in series to provide current for telegraph and telephone systems. See also *Accumulator; Battery; Electricity.*

Leyte (*lā'tā*), an island of the Philippine archipelago, in 125° E. longitude and 10°-12° N. latitude, eighth largest of the group. The island has an area of 2,785 sq. m. and is irregular in shape and slightly elongated. The coastline on east and west is deeply indented by two large bays which slope inward leaving a narrow strip of 18 m. in the island's mid-section. A lengthwise range of mountains traverses its center. These mountains, which never rise above 4,400 ft., have a luxuriant growth of pines and other trees of commercial value. The soil in the lowlands is fertile and productive, yielding rich crops of sugar cane, coconut, and hemp. The climate is extremely hot and humid and much of the flora is tropical. Bamboo, banyans, and palms grow profusely, and 50 per cent of the land area is arable. There are rich deposits of iron ore and other minerals.



THE LEYDEN JAR EXPERIMENT
From an 18th-century woodcut

Leyte was occupied by the Japanese when the Philippines were abandoned in 1942. On Dec. 25, 1944, the campaign for Leyte led by Gen. MacArthur's forces was ended. Six hundred vessels brought the Sixth Army to Leyte. From one of these vessels, MacArthur stepped ashore, 2½ years after he had quit Bataan, and made a simple announcement: "People of the Philippines," he said, "I have returned. By the grace of Almighty God our forces stand again on Philippine soil—soil consecrated in the blood of our two peoples—Rally to me. Let the indomitable spirit of Bataan and Corregidor lead on."

More men went ashore on the first day of the Leyte invasion than landed in Normandy on D-Day. Perhaps 225,000 swept inland. Leyte was the real battle for the Philippines. Total Japanese casualties were estimated at 90,000. The liberation of the whole archipelago was secured July 4, 1945. Population, *ca.* 1,250,000. See *World War II.*

Lhasa (*lä'sạ*) or LASSA, capital of Tibet, located on the northern slopes of the Himalayas, on a high fertile plain about 12,000 ft. above sea level. Lhasa is the seat of Lamaism (*q.v.*), a branch of Buddhism (*q.v.*), and is a sacred city of Buddhism. It is the traditional residence of the Dalai Lama, and the site of his palace, as well as of many famous shrines, temples, and monasteries. Lhasa was known as the "Forbidden City" until it was opened to Westerners late in the 19th century. In the past it has been a place of pilgrimage and religious festivals, and a terminus of the caravan trade with India, Burma, and China. Tea, silks, carpets, rice, tobacco, horses, and sheep were the principal articles of trade. The main trade route with India is through Sikkim. Lhasa is now occupied by the Chinese Communists. The population is estimated at 30,000 to 50,000.

Lhevinne (*lä-vĕn'*), JOSEF, pianist, born in Moscow, Russia, Dec. 14, 1874; died in New York City, Dec. 2, 1944. He began studying at an early age at the Moscow

JOSEF LHEVINNE

Conservatory, and made his debut at 14. After teaching and touring as a concert pianist in Europe, he came to America in 1906 and remained for a season of concerts. In the years before World War I, he and his wife, Rosina, who frequently appeared with him in a duo-piano team, made their home in Berlin. They were interned during the war, but as soon as they could leave, came to the U.S. From 1920 until his death in 1944, Lhevinne toured America each year as one of its leading pianists. He also gave concerts in Latin America and in Europe during the seasons of 1926, 1929, and 1933.

Liana (*lĭ-ä′nȧ*), or LIANE, the name applied by French travelers to a large variety of twining and climbing plants of tropical forests, but now commonly used by travelers of all nations. Most lianas have woody, ropelike stems and climb to the tops of trees, but sometimes run very far along the ground. Some species, such as the clematis and honeysuckle, are found in colder climates. In many tropical countries, where rainfall is unusually large, the lianas grow to the tops of the highest trees, often entwining the trunks with such force as to suppress life, and in other instances bearing heavily upon the branches, even breaking down large trees by their heavy vines and foliage. In some localities a dense network is formed among the forest trees, making it almost impossible to penetrate them without cutting passages, while animals keep open narrow paths by continuous use, or pass from bough to bough along the heavier vines. Many species bear beautiful flowers, others possess medicinal properties, and some are used in the manufacture of baskets and small wooden ware. The Amazon valley of South America, the lake region of Africa, and tropical Asia present notable districts in which lianas thrive.

Lias (*lī′ăs*), in geology, a formation situated at the base of the Jurassic or Oölitic deposits. It consists principally of thin beds of blue or gray limestone which become light brown when exposed. The Lias formations contain abundant marine fossils, among them those of fishes, reptiles, and mollusks. They are likewise rich in numerous remains of plants.

Libby Prison (*lĭb′bĭ prĭz′ŏn*), a large building formerly located in Richmond, Va., used as a Confederate military prison during the Civil War. Before that time it served as a tobacco warehouse and was so named from the owner. The first prisoners were confined there after the first Battle of Bull Run and at times it contained 1,200 prisoners. In 1864 a tunnel about 50 ft. long was excavated by prisoners, and 109 made their escape, but half of them were recaptured before they reached the Federal lines. The structure was taken apart and removed to Chicago in 1888 and was there opened as a museum. Later it was taken down for its material.

Libel (*lī′bĕl*), the act of making an attack in writing, printing, or by signs, upon the character or reputation of another. It differs from slander in that the latter constitutes a similar injury by spoken words. Although liberty of speech and the press are recognized in all the states, both are restricted to an extent whereby the good name and character of all are protected. If statements that are true as an entirety be published against an individual, the act of publication is justifiable. However, in some states it has been held necessary to show that the publication was made for justifiable reasons and with good motives.

Liberal Arts (*lĭb′ĕr-ȧl ärts*), a term designating the fields of the humanities, of languages, mathematics, and all fields of natural science, as opposed to the *fine arts*, which comprise architecture, sculpture, painting, music, poetry, dance, etc. A college of liberal arts is an institution which offers the fundamentals in the liberal arts, rather than a professional or vocational education such as that offered in a school of medicine, law, or engineering.

Liberal Arts Education (*lĭb′ĕr-ȧl ärts ĕd-ū-kȧ′shŭn*), a term characterizing a general, non-professional education designed to develop a mature human personality beyond specific professional knowledge. "Liberal" in this context does not have its usual modern connotations but implies the meaning of the word in the Middle Ages. The Scholastics had called their main objects of study—the *trivium* (grammar, rhetoric, and logic) and the *quadrivium* (arithmetic, geometry, astronomy, and music)—the "liberal arts," and they were thus symbolized and depicted through the centuries. Later, the word took on the meaning of a general and comprehensive education.

Western civilization is based on two sources:

the classics (*q.v.*) in philosophy, art, and literature, the tradition of our Greek and Roman heritage; and Christian thinking, as developed in the Middle Ages by the Scholastic thinkers. The emphasis on these sources is the outstanding characteristic of liberal arts education. It demands that the study of natural science and, still more, of mere technical subjects, take second place although conceding that it may be useful from a practical point of view as a preparation for certain professions. The advocates of this school of thought believe that the study of science and technique can never substitute for study of the liberal arts, which affords a general intellectual preparation for life, conveying as they do the foremost thoughts and ideas of the past. They believe that liberal arts are actually intellectual arts, enabling men to understand worldly things, to contemplate the stuff of human experience, to direct the mind, and that language and mathematics, philosophy and history, are the tools best fitted to do this work of direction.

Thus, students of the liberal arts study the ancient languages, prepare for the enjoyment of art, literature, and music, learn the English language by tracing its development and reading its most representative works, and study mathematics and natural science not for their own sakes but as a means to clearer abstract thinking. All methods of instruction in the liberal arts have in common that they try to avoid teaching merely the details of trade, profession, or technique. In every case, their goal is to teach the student to think for himself in terms of the humanities, to plan a curriculum which creates for him a world and not merely a profession.

A liberal arts education, although primarily not practical, nonetheless creates, at its best, a more versatile mind than a strictly professional education and enables the individual to adapt himself to new and foreign realms of human experience and knowledge more easily and more quickly.

During the last 10 years, liberal arts education in the U.S. has been tremendously stimulated by the work of Dr. Robert Maynard Hutchins and Dr. Mortimer J. Adler, both of the Univ. of Chicago. Under their influence St. John's Coll. in Annapolis, Md., has compiled a list of 100 essential ("great") books which students of liberal arts should read. From Homer and Virgil to Dante, Chaucer, Cervantes, Rabelais, Shakespeare, Corneille, Racine, Milton, Goethe, Balzac, Dickens, Flaubert, Thackeray, Dostoyevski, and Tolstoi, the main authors are represented, as are the greatest philosophers, Plato, Aristotle, Descartes, Erasmus, Bacon, Montaigne, Leibnitz, Montesquieu, Kant, and James. Among the historians are Thucydides, Plutarch, Tacitus, Gibbon; among the mathematicians and natural scientists, Euclid, Ptolemy, Harvey, Galileo, Copernicus, Boyle, Malthus, Newton, Darwin, Mendel, Ostwald; among the theological works, the Bible, Augustine, Bonaventura, Calvin; in government and economics, Machiavelli, the U.S. Constitution and "Federalist Papers," Rousseau, Marx, Smith, etc. Obviously it is a diversified list and, if actually studied, one of the most solid possible intellectual foundations.

See also *Humanism; Humanities; Scholasticism.*

Liberal Republican. See *Liberals.*

Liberals (*lĭb'ĕr-ăls*), term used especially in politics and economics, but also, in a more general sense, in connection with all spiritual and intellectual movements which favor evolutionary change and reform. We find liberal trends in the historic development of the ancient states as well as inside the Roman Catholic Church and other religious communities. Liberal parties, advocating reform, have existed in almost all countries of the world under one name or another. In France, the so-called radicals of the 19th century were in actuality liberals.

The Liberal party in *England,* the lineal successor of the old Whig party, grew out of a coalition of the Whigs and Radicals about 1830. Its program embraced, among other goals, free exercise of individual energy, religious freedom, free trade, reform of the constitution. Its greatest champion in the 19th century was W.E. Gladstone (1809-98), leader of the party after 1867 and four times Prime Minister. However, when he included (1886) Irish Home Rule and purchase of the Irish landed estates by the government among Liberal tenets, a party division took place. The Marquis of Hartington, Joseph Chamberlain, and G.O. Trevelyan, believing bills of this kind dangerous to the Empire, broke away, forming the *Liberal Unionist* party. This party subsequently merged with the Conservative party. David Lloyd George was one of many other remarkable Liberal Prime Ministers (others have been Earl Grey, Earl Russell, Viscount Palmerston). Lloyd George added (1909) social reform to the traditional free trade program of the Liberal party. When he became Prime Minister (1916) of a coalition government the Liberal party again split, this time into two factions, the one backing Asquith, the other Lloyd George. They were reunited, however, in 1926, only to be again divided, this time into three groups in 1931: Sir John Simon, Sir Herbert Samuel, both of whom supported MacDonald's National (coalition) government, and Lloyd George heading rival groups.

Liberal parties in *Germany* came into being at the beginning of the 19th century. After the defeat of Napoleon and the re-establishment of peace (1815), the German government tried to restore complete absolutism at home, Prince Met-

ternich, chancellor of the Emperor of Austria, guiding them as the standard-bearer of reaction. The so-called Holy Alliance of Frederick William III of Prussia, Francis I of Austria, and Alexander I of Russia clearly exhibited the same tendency, a trend incompatible with the principles of those who had fought in the War of Liberation (1813-15) in the hope that individual and political freedom would follow. The main task of the German Liberals (or democrats) was the fight for the promulgation of constitutions and representation of the people, as well as a closer alliance among the German states. Toward this end, liberal parties were organized and slowly gained a few reforms. Such parties, with a variety of names and aims, thereafter kept progressive thought alive until Hitler (*q.v.*) outlawed all liberal parties. See also *Germany:* History.

In a country such as the U.S., where the theory of government has been since its founding based on the idea of "liberty and justice for all," every party has considered itself more or less liberal. The history of liberalism in the U.S. is therefore identical with that of both the major and minor political parties in the U.S. (*q.v.*). The word "liberal" as a party name has been used only twice in American history. In 1870, the Liberal Republican party, under the leadership of Carl Schurz, bolted the Republican party, declaring in favor of tariff reform, civil service reform, universal suffrage and cessation of "unconstitutional laws to cure Ku Klux Klan disorders, irreligion, or intemperance." In the Presidential campaign of 1872, the party, dissatisfied with the results of President Grant's first term, joined the Democrats in supporting Horace Greeley. Greeley was defeated, however, and the short-lived party died out.

In May 1944, a new Liberal party was formed by dissenters from the American Labor party (which was felt to have fallen under Communist domination). Its main purposes were to encourage U.S. cooperation with the rest of the world and to oppose forces of reaction. On the national scene, Liberal support was consistently Democratic.

Liberia (*lī-bē'rī-ä*), a republic of Africa, on the northern coast of the Gulf of Guinea, extending northwest from Cape Palmas. It is bounded on the N.W. by the Mano River and Sierra Leone, on the N. and E. by French Guinea, and on the S.E. by the Cavally River and the Ivory Coast. It has a coastline of 350 m. and extends inland from 75 to 150 m. The area is *ca.* 43,000 sq. m.

Description: The coastal regions of Liberia form an undulating plain. The inland plateau has an average elevation of 1,500 ft. above sea level, and in the north are mountain ranges of considerable height. The interior is heavily forested. The soil is generally fertile, and the country is drained by numerous streams. The climate is tropical, with an average annual rainfall of 100 to 150 in.

Mining: Some alluvial gold is mined, and diamonds have been found. Liberia has vast amounts of an excellent grade of iron ore, under increasing recent exploitation by U.S. interests.

Agriculture: The principal food crops are rice, sugar cane, cassava, coffee, and bananas. Forest products, gathered for export, include piassava fiber, palm kernals, and wild rubber. The most important crop is cultivated rubber. The Firestone Rubber Co. (U.S.) and other producers, with long-term government concessions on vast acreages, produce *ca.* 75,000,000 tons per year.

Transportation and Commerce: One short railway (40 m.) connects Monrovia with the Bomi Hills iron range. There are *ca.* 600 m. of motor roads; much inland transport is by native porters on foot trails. Shallow-draft motor vessels can go 60 m. up the Cavally River and 25 m. up the St. Paul, and small vessels ply coastwise. Liberia, in 1953 and 1954, exceeded all other nations in the increase in registration of merchant shipping. In 1948 modern port facilities, constructed with U.S. aid, were opened at Monrovia. Foreign trade is principally with the U.S., The Netherlands, and Great Britain. Exports consist mostly of rubber, iron ore, and palm kernels; imports, of foodstuffs, cotton fabrics, and light consumer goods. Robersfield, 50 m. from Monrovia, has an international airport. There are few telephones, but there are cable and radio communication facilities.

Education and Religion: Education is provided by over 400 government and religious-mission elementary schools, about 20 high schools,

TAPPING A RUBBER TREE IN LIBERIA

Courtesy Firestone News Service, Akron, Ohio

and about 30 tribal schools. The government maintains a university and the Booker Washington Inst., a technical school. Recent estimates, however, indicate that 90 per cent of the population is still illiterate. Many of the inland natives are pagans, but numerous Protestant denominations and the Roman Catholic Church maintain churches and missions.

POPULATION: The population is entirely Negro, of some 17 principal tribes together with *ca.* 20,000 descendants of 19th-century American Negro colonists. The official language is English. The principal cities are Monrovia, the capital (pop., *ca.* 20,000), Robertsport, Buchanan, Marshall, and Harper. Population (1955 est.), between 1,500,000 and 2,000,000.

GOVERNMENT: The constitution of Liberia is modeled upon that of the U.S. The president, who is elected for eight years and may be re-elected for another four-year term, is aided by a cabinet. There is a 10-member senate and a 31-member house of representatives. The franchise is restricted to persons of Negro blood and landowners. In 1947 women received the right to vote, and in 1951 women and aboriginal landowners voted for the first time. All able-bodied male citizens between the ages of 16 and 45 may be called for military service. The defense force numbers 4,000, plus a frontier force of 1,200 men.

HISTORY: Liberia was founded as a homeland for liberated U.S. slaves. The first settlement was made in 1822, and on July 26, 1847, the colony formally became the Republic of Liberia. Great Britain recognized its independence in 1848; other nations followed, including the U.S. in 1862. In World War I, Liberia declared war on Germany (Aug. 17, 1917), later signing the Versailles Treaty and joining the League of Nations. During World War II, Liberia granted the U.S. air-base rights (1942), and in 1943 the U.S. extended Lend-lease aid. Liberia declared war on the Axis powers on Jan. 27, 1944, later becoming a charter member of the U.N. In 1950 the U.S. extended to Liberia a grant of $30,000,000 for economic assistance and cooperation and for technical aid. The year 1951 saw the completion of Liberia's first railroad and its first exportation of iron ore (now averaging more than 1,000,000 tons per year).

Liberty (*lĭb'ĕr-tē*), STATUE OF. See *Statue of Liberty*.

Liberty Bell, a famous bell of the U.S. It formerly hung in Independence Hall, Philadelphia, Pa., and was rung on July 8, 1776, to announce the news of the signing of the Declaration of Independence (signed July 4). Brought from England in 1752, it was twice recast in 1753 because it had cracked. In 1835, while being tolled in memory of Chief Justice John Marshall, it cracked again. It is kept on exhibit at Independence Hall. The bell is inscribed: "Proclaim

LIBERTY BELL

liberty throughout all the land unto all the inhabitants thereof" (Leviticus 25:10).

Liberty Party, a political organization of the U.S., formed in 1839 to oppose slavery. Though it never grew large, it exerted a considerable force on public opinion. Its first Presidential candidate was James G. Birney, who in 1840 received 7,069 votes and in 1844, 62,300. In 1847 the party nominated John P. Hale, but he withdrew when Martin Van Buren was nominated by the Free Soil party, which ultimately absorbed the Liberty party.

Libido (*lĭ-bē'dō*), in psychology, sexual desire, one of the most powerful instincts of mankind, rarely fully satisfied. The term became widely known through the writings and doctrines of Sigmund Freud (*q.v.*), who explained almost all psychopathological disturbances as resulting from deviations, inhibitions, repressions, and frustrations of the natural libido.

Libra (*lī'brȧ*). See *Zodiac*.

Library (*lī'brȧ-rĭ*), a collection of books or written and printed material; also the building or place in which they are kept. Knowledge of early libraries is scanty and few evidences of early writings have survived the vicissitudes of the ages since the beginning of civilization (*q.v.*). Libraries may be said to date from that time. Invasions, wars, and fires all took their toll, leaving vague records of early hieroglyphic and cuneiform writings for the archaeologists to discover. Stone and clay tablets were probably used earliest, followed in turn by papyrus rolls, parchment, and paper. Temples, as the center of activity and life, housed the first libraries.

Previous to the 19th century B.C. the Semites conquered the Akkadians, who are known to have had large collections of tablets in libraries.

One of the first known librarians was the Babylonian, Amel-anu. Shalmaneser I is credited with founding the first Assyrian library at Calah (1300 B.C.) but it was the Royal Library at Nineveh (700 B.C.) that is better known.

A palace library of King Nefirikere (2750 B.C.) is said to have had medical papyri in portable cases and a royal library of the Phoenicians was in existence in the beginning of the 11th century B.C. The most important collections of the ancient world were the twin libraries of Alexandria (284 B.C.) founded by Ptolemy, which were rivaled by the library of Pergamum in Asia Minor. During Julius Caesar's siege of Alexandria (47 B.C.) the collection was partially destroyed; later it was replaced and presented to Cleopatra by Mark Antony.

Greek papyri dating from 4000 B.C. have been discovered, and in 330 B.C. the first public library in Athens was established. Later, manuscripts, as spoils of war, from Greece, Asia Minor, and Syria, were brought to Rome, where were founded the Octavian (33 B.C.) and Palatina (28 B.C.) libraries.

At the time (330 A.D.) Constantine the Great changed the seat of the empire from Rome to Constantinople (Istanbul) he established a library of 6,000 volumes, which had increased to 100,000 when it was destroyed by fire in 477.

Early Chinese records show that in 221 B.C., Shih Huang Ti gave orders for the destruction of all writings except those dealing with agriculture, medicine, and divination. This law was repealed in 190 B.C. and a national university was established (124 B.C.) for the study of the restored Confucian classics.

Yakatsugu, who founded the Untei, "Home of Papyrus," at Isonokami, about 775, is considered to be the first person in Japan to establish a library. A large library was built by Caliph Ali Mumun (183-33 B.C.) at Baghdad in connection with an astronomical observatory.

With the pillage of Rome by the Vandals, the libraries were destroyed by fire, mutilation, or decay. However, small collections or individual manuscripts were preserved and copied by monks in the various monasteries, which became the centers of learning. Early Benedictine monastic collections were those of the Abbey of Monte Cassino, Italy (528), and Canterbury, England (596). The Augustinian, Franciscan, and Dominican orders also established many collections.

Arabic libraries existed in the 9th, 10th, and 11th centuries at Baghdad, Cairo, Cordova, and Tripoli. There was a large collection of manuscripts at the university library at Salamanca, Spain (1254). In France, Charles V established a library and in Hungary, Matthias Corvinus, the king, amassed a large collection. During the Renaissance, between the medieval and modern periods, there was a revival of learning and a tremendous interest in the collecting of books of the nonreligious and classical influence. Many princely and royal collections later formed the basis of collections of the large modern libraries. The invention, in the middle of the 15th century, of printing from movable type revolutionized book collecting and the development of libraries.

Renowned for its book treasures and ancient libraries of great beauty, Italy has 36 state libraries. Important libraries are the Laurentian (1571; 42,000 vols., 10,000 mms.[1]) Florence; Marciana (1468; 550,000 vols., 12,000 mms.) Venice; National Central Library (1747; 3,400,000 vols.) Florence; and National Central Library, Vittorio Emanuele (1875; 1,500,000 vols.) Rome, which is the center of inter-library lending. Holding a preeminent position among libraries of the world because of its beauty and rare treasures is the Vatican Library (1450; 700,000 vols., 50,000 mms.) Vatican City.

The greatest library of France and the oldest of the European national libraries is the Bibliothèque Nationale (1480; 5,000,000 vols., 130,000 mms., 240,000 medals and coins, 3,100,000 prints and engravings) Paris. The following libraries, also in Paris, are closely connected with the Nationale: the Mazarine (1643; 300,000 vols., 5,800 mms.); the Arsenal (1797; 1,000,000 vols., 11,500 mms., 120,000 prints), renowned for its literary and theatrical collections; Sainte-Geneviève (1624; 800,000 vols., 30,000 prints, 4,000 mms.) an encyclopaedic library, specializing in philosophy, ancient law, and science; and the University of Paris (1289; 1,500,000 vols., 2,000 mms.) including the Sorbonne. There was little or no war damage to these libraries during World War II. Also in Paris is the American Library (1918; 100,000 vols.) founded by the American Library Association for American troops during World War I and later (1920) established as a permanent institution.

Germany has no single national library, but each state has its own library. These form the backbone of the library system, which in 1932 included 2,800 libraries, open to the public, with 55,000,000 volumes. There is a great distinction between the *Wissenschaftliche Bibliotheken* (learned) and *Volksbüchereien* (popular). Outstanding pre-World War II state libraries were the Prussian (opened to the public 1661; 2,850,000 vols., 68,500 mms., 300,000 maps), one of 250 libraries in Berlin; and Bavarian (16th century; 1,580,000 vols., 50,000 mms.) in Munich. These libraries were greatly damaged during World War II, as was the *Deutsche Bücherei* (1912; 1,500,000 vols.) in Leipzig, which is a national copyright reference library for German literature.

The largest library of Austria and one of the

[1] Manuscripts.

chief of Europe is the National Library (1493; 1,313,000 vols., 27,000 mms.) in Vienna. In Budapest there are the University Library (1635; 738,000 vols.) and the Library of the Hungarian National Museum (1802; 957,000 vols.). The Library of the University of Cracow (1400; 620,000 vols., 6,800 mms.) is the oldest of the learned libraries of Poland, and until the founding of the National Library (1930; 500,000 vols.) in Warsaw it occupied that position. Czechoslovakia's principal library is the National and University Library (1348; 1,500,000 vols.) at Prague, but the Prague City Library (1891; 640,000 vols.) with its 50 branches is unusually progressive. About 2,000,000 volumes from various libraries were destroyed during World War II. An example of outstanding modern architecture is the National Library of Switzerland (1895; 700,000 vols.) at Berne. At Geneva is the League of Nations Library (1920; 333,000 vols.) to which the Rockefeller Foundation gave a large gift in 1927 for a building.

In Spain there are the National Library (1712; 1,500,000 vols.) and University Library (1341; 400,000 vols.) in Madrid as well as other learned libraries, and many people's libraries in various cities. Portugal's National Library (1796; 500,000 vols., 150,000 mms.) is in Lisbon, and among the cities having large public libraries are Lisbon, Coimbra, Évora, Oporto, and Ponta Delgada.

In the Scandinavian countries the national and state libraries are of early founding and contain rare manuscripts and collections. Their public library systems in the Anglo-American pattern are of comparatively recent growth and are usually assisted by state grants. The Royal Library (1661-64; 1,000,000 vols., 35,000 mms.) at Copenhagen, the largest in Scandinavia, contains the Flatoe Book, which gives the story of the Norse discovery of America 500 years before Columbus.

The old state and private libraries of Czarist Russia contained magnificent collections of rare volumes, which formed the basis of the large modern libraries established since the Revolution of 1917. One of the largest libraries in the world is the Lenin State Library (1865; 10,000,000 vols.) at Moscow, which expects to have 16,000,000 volumes by 1950. Equally stupendous in its recent growth is the Saltykov-Shchedrin Public Library (1714; 9,500,000 vols., 250,000 mms.), Leningrad, which adds 1,000 new publications daily to its collection. About the beginning of World War II there were 250,000 state libraries in the U.S.S.R., with 500,000,000 books. It was estimated that 23,400,000 books were destroyed by the Germans during World War II.

Prior to the Japanese invasion (1937), China had 1,527 libraries. The National Peiping Library (1909; 100,000 vols. of occidental books; 500,000 of Chinese; 8,000 mms.) has part of its collection at Kunming while the National Central Library

Courtesy British Information Services, N. Y.

BRITISH MUSEUM READING ROOM, LONDON

at Peisa, Szechwan, has a branch at Chungking (440,000 vols.). In 1945-47 the U.S. Department of State allocated $100,000 to the American Library Association for the purchase of books for China.

In 1946 there were 3,398 libraries in Japan with 9,651,640 volumes, the largest being the Imperial Library at Tokyo (1872; 800,000 vols.). During World War II, 138 libraries were damaged. The most important library in India is the Imperial Library at Calcutta (1902; 400,000 vols.). Broad plans for public libraries in free India were formulated in 1947. Most of the libraries of the Philippines, including the National Library (1900; 700,000 vols.) and the Library of the University of the Philippines (150,000 vols.) were destroyed by the Japanese during World War II. Since then books and funds are being collected to re-establish them. In Hawaii libraries compare favorably with those in the U.S. The Library of Hawaii at Honolulu (1913; 200,000 vols.) is the largest in the islands.

Founded in 1753 through the will of Sir Hans Sloane, the British Museum Library, London, is the national library and contains 5,000,000 printed books and thousands of manuscripts, including rare Hebrew, Greek, Latin, Syriac and Anglo-Saxon writings. The Bodleian Library (1602; 1,500,000 vols., 40,000 mms.) at Oxford University was the first public library in Europe and is one of the great university libraries in the world. Cambridge University library has 1,500,000 volumes and 10,000 manuscripts. The British Library Association reported that 1,145,500 volumes were destroyed during World War II in bombed libraries.

Among the first libraries in North America, in

addition to the many private collections, were those connected with schools and colleges; Harvard University (1638; 4,610,000 vols.); Yale University (1700; 3,365,000 vols.); and William and Mary College (1692; 265,000 vols.). Rev. Thomas Bray (1656-1730) established 39 parochial libraries in the Colonies. Subscription and mercantile libraries and athenaeums were popular in the 18th and 19th centuries, and several established at that time are still in existence. Benjamin Franklin organized the first subscription library in 1731. The Library of Congress (*q.v.*), in reality the National Library, was founded in 1800. It includes among its treasures not only manuscripts and all types of printed matter but phonograph records and photographic negatives as well. More than $6,000,000 are expended by the library annually, and it has a staff of 1,700 persons. The New York Public Library, the largest public library in the world, was established 1895 by a consolidation of the Astor (1849) and Lenox (1870) libraries and funds from the Tilden endowment. In 1944 it had 4,529,000 volumes and circulated 9,959,881 books. Between 1890 and 1917 Andrew Carnegie gave $43,665,000 for library buildings in the U.S. and Canada. In 1945 there were 11,380 libraries in the U.S., including 7,995 public, 435 junior college, 1,178 higher education, 312 law, 204 medical, 131 institutional, 187 hospital, 223 federal, 157 state, and 558 special.

The 6,025 public libraries reporting statistics for 1944-45 contained 124,675,283 volumes (1.4 volumes per capita) and circulated 333,365,487 books to their 22,890,988 registered borrowers. Their income was $64,917,302, expenditures $61,790,307 (70 cents per capita) and total employees, 37,382.

The growth of school libraries since 1900 is an important development in the library field in the U.S., with 52,360,302 books reported for the 13,103,803 pupils in 74,762 school systems.

The American Library Association (*q.v.*), an organization with 16,000 members, has accomplished much in the development of libraries and in planning for the future of library service.

In 1946 there were 904 libraries in Canada: 569 public, 168 university and college, 51 dominion government, 28 provincial government, 13 law society, 14 technical society, 33 business libraries, and 25 miscellaneous. The Library of Parliament (1849; 500,000 vols.), Ottawa, is one of several governmental libraries. There are also large libraries at McGill University (1821; 435,000 vols.); Laval University (1663; 253,427); and Toronto University (1842; 425,000).

Important libraries are located in the capital cities of many South American countries, including Cuba, Mexico, Argentina, Brazil, Peru, and Chile. Considerable assistance in modernizing libraries and their systems and establishing library schools has been given by North American librarians and various private funds.

Library of Congress, the national library of the U.S., located at Washington, D.C., and containing the largest collection of books and manuscripts in the Western Hemisphere. It was founded on Apr. 24, 1800, and from this date until 1897 was housed in rooms of the Capitol building. In 1814, the collection was destroyed by fire when the British burned the Capitol, but was replaced in the following year by the private library of Thomas Jefferson. In 1851 a disastrous fire destroyed many other books, including two-thirds of the Jefferson collection. The publications of the Smithsonian Institution were transferred to the Library of Congress in 1866. The main building, completed in 1897 at a total cost of about $7,000,000, lies 1,250 ft. E. of the Capitol. On Apr. 5, 1939, the Library of Congress Annex, with a capacity of 12,000,000 volumes, was completed for use at a cost exceeding $8,000,000.

As of June 30, 1947, the Library of Congress buildings contained 8,187,064 volumes and pamphlets; 121,251 bound newspaper volumes; 1,869,970 maps and views; 66,181 microfilms (reels and strips); 1,743,394 volumes and pieces of music; 274,092 phonograph recordings; 578,527 fine prints; 1,063,879 photographic negatives, prints, and slides; 61,100 motion-picture reels; and more than 8,620,000 manuscripts, and 560,188 other pieces including broadsides, photostats, posters, etc. The two buildings contain 36 acres of floor space and 414 m. of shelving. There are about 1,665 employees on the staff.

In addition to the reading rooms and stacks, the main building houses the College auditorium for chamber music, the Whittall Pavilion accommodating the collection of Stradivari stringed instruments, and the Hispanic Room, which contains murals of the Brazilian artist, Candido Portinari.

The annex houses the U.S. copyright office, the branch printing office and bindery, photoduplication service, and the processing department. There are two large reading rooms, a catalog room, and 172 individual study rooms.

The Library of Congress exists principally to serve members of Congress and officers of the government in general. To this end, the library maintains a reference department, a legislative reference service, the law library, the divisions of aeronautics, orientalia, maps, manuscripts, general reference and bibliography, music, prints and photographs, rare books, and the Hispanic Foundation.

In addition to these services, the library has established the union catalog, which will serve upon completion as a finding catalog for research books in American libraries; the photoduplication service, which supplies scholars anywhere with copies of materials in its possession;

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the archive of American folk song and recording laboratory which preserves and distributes folk music of the country; the interlibrary loan service which provides material from its collections to inquirers unable to use them at the source; and a card division, which sells copies of catalog cards to other libraries, saving them costs in cataloging time, staff, and building space.

The Copyright Office, administered by the Register of Copyrights, forms part of the Library of Congress. It receives annually over a quarter of a million books, pamphlets, prints, maps, etc., as deposits, which, for the most part, become part of the permanent collections of the Library. The Librarian is L. Quincy Mumford.

Libya (*lĭb'ĭ-ȧ*), an independent kingdom located on the northern coast of Africa. It is bounded on the N. by the Mediterranean Sea, on the E. by Egypt and the Sudan, on the S. by French Equatorial Africa and French West Africa, and on the W. by Algeria and Tunisia. The area is 679,358 sq. m. Most of the inland country is desert or sub-desert, with scattered fertile oases, but the coastal lands (some 20,000 sq. m.) are the most fertile in North Africa. Agricultural products include cereals, tobacco, dates, olives, oranges, figs, and grapes. Livestock consists mainly of sheep, goats, and camels. Sponge and tunny fishing are important. Manufactured products include wool and cotton fabrics, brick, olive oil, leather, and esparto grass (for papermaking). The population consists mostly of natives of Arab, Berber, and Jewish stocks, with a considerable admixture of Italians. The state religion is Islam, but other religions are permitted. The official language is Arabic. Education is still somewhat scanty, but there are *ca.* 350 elementary schools, 15 secondary schools, and a few teacher-training schools. There are also some schools for commercial, technical, and agricultural training, Jewish and Koranic private schools, and American, British, and Italian schools. There are 223 m. of railroad, but most transportation is by caravans in the inland area and by buses and trucks in the coastal area. Benghazi and Tripoli are on regular airline routes. The capital from April through October is Benghazi (pop., 1954, 70,533), and from November through March, Tripoli (pop., 130,238). Other major cities include Homs, Misurata, and Derna.

Libya was the ancient Greek name for northern Africa (excluding Egypt). The area came under Turkish rule in the 16th century. It was annexed by Italy on Nov. 5, 1911, and was thereafter industriously colonized by Italians, aided by their government, to insure its Italianization. In 1939 all its provinces, except for the Libyan Sahara, were incorporated into the national territory of Italy. Long and fierce desert warfare during World War II brought Libya (Jan. 20, 1943) under British administration. In accordance with a U.N. decision, a federation was formed of the three provinces of Cyrenaica, Tripolitania, and the Fezzan, and on Nov. 25, 1950, a national constituent assembly proclaimed the independence of Libya. The constitution set up a hereditary monarchy, and the Emir Sayed Mohammed Idris el-Senussi took the throne as Idris I. The king is assisted by a prime minister and a cabinet. The bicameral legislature consists of a 24-member senate (eight from each province) and a 55-member house of representatives (one for each 20,000 inhabitants). Libya joined the Arab League (*q.v.*) on March 28, 1953, and thereafter tended to act with that bloc on Middle Eastern political questions. It was admitted as a member of the U.N. on Dec. 14, 1955. Population, 1954, 1,091,830.

License (*lī'sẹns*), in law, a document conferring a permission to do some act which would otherwise be unlawful. The object of issuing licenses is twofold: to raise revenue, or to regulate certain trades and professions, or both. The manufacture and sale of tobacco and intoxicating liquors are usually regulated by license, as are also peddling and the management of places of amusement. Licenses are required in many special cases, such as those necessary before marriages may be solemnized; but these are issued so as to maintain a record and prevent the marriage of persons who are not legally qualified to marry, and the element of revenue is eliminated.

Lichen (*lī'kẹn*), a compound plant, composed of a fungus and numerous tiny algae, belonging to the lowest division of plant life (*Thallophytes*), without roots, stems, leaves, flowers, or seeds. Algae, because they contain chlorophyll (*q.v.*), are able to make their own food; fungi, without chlorophyll, must get their food from other organisms. Thus the algae of the lichen make food for both parts, and the fungus absorbs water for both. Lichens grow in all climates, sometimes in

crustlike patches of various colors on wood, rocks, or soil, sometimes in erect forms with many slender branches. Those which grow on rocks are geologically interesting because their acid content starts the slow process of weathering by which the rock is broken down into soil. Important lichens are reindeer moss and Iceland moss, on which animals in cold regions feed, and the edible manna-lichen, which is found in North African deserts. Other lichens are useful as the sources of such dyes as archil and litmus (*q.v.*).

Lichnowsky (*lĭk-nōv'skȳ*), KARL MAX, PRINCE VON, born at Kreuzenort, Silesia, Germany, Mar. 8, 1860; died at his estate, Kuchelna, Feb. 27, 1928. Lichnowsky played a historic role in 1914 as the German ambassador to Great Britain who struggled in vain to maintain peace. His most noted publication is the so-called "Lichnowsky Memorandum," in which he traced the events precipitating World War I.

Lick (*lĭk*), JAMES, philanthropist, born in Fredericksburg, Pa., Aug. 25, 1796; died in San Francisco, Calif., Oct. 1, 1876. After obtaining an education, he spent some years in South America, and in 1847 settled in California, where he became immensely rich. Besides liberally supporting local enterprises, he donated $60,000 to erect a monument in Golden Gate Park to Francis Scott Key, $100,000 to found an old ladies' home in San Francisco, $100,000 for bronze figures to be erected at the city hall of San Francisco, $150,000 for the construction and support of public baths in San Francisco, $540,000 to establish the California School of Mechanical Arts, and $700,000 to build the Lick Observatory (*q.v.*).

Lick Observatory, an institution of the Univ. of California, built with a fund given by James Lick. It is situated 25 m. E. of San Jose, Cal., on one of the summits of Mt. Hamilton, and contains a 36-in. object glass. A condition of the gift was that the instrument "should be superior to and more powerful than any telescope ever made." It is now surpassed in size by several more powerful telescopes. The remains of Lick were placed in the vault at the base of the 30-ft. pier supporting the telescope.

Licorice (*lĭk'ô-rĭs*), or LIQUORICE, a class of leguminous plants found in Europe, Asia, and Africa. They are cultivated for the juices found in the roots, which serve in preparing a medicine of value in the treatment of throat and catarrhal diseases. The plants include several species, attain a height of about 4 ft., bear violet-colored flowers, and have roots growing about 3 ft. into the ground. Their leaves are alternate and pinnate, and the plants have few branches. The juices are pressed from pulp prepared by crushing the roots of plants having at least three years' growth. The liquid portions are evaporated by heating, and the solid parts are made into sticks and sold in that shape. They are packed for shipment with bay leaves. Pure licorice has decided medicinal virtues. The medicinal qualities arise from the property of licorice in aiding expectoration and its healing influence upon the irritated portions of the mucous membrane. The only species of licorice found in America is a plant known as *Glycyrrhiza lepidota,* which thrives in portions of the Mississippi Valley, especially in Missouri.

Lictor (*lĭk'tȯr*), in Rome, a public officer appointed to attend upon the magistrates. The ancient kings were always preceded by 12 lictors, who bore the *fasces,* or a bundle of rods with an ax. The rank of the magistrates determined the number of lictors. A praetor had 2; a propraetor, 6; a consul, 12, and a dictator, 24. The lictors inflicted punishment on condemned Roman citizens.

Lidice (*lĭd'it-shē*), a village in Bohemia, Czechoslovakia, 10 m. W. of Prague (Praha), population about 400, chiefly miners. Because the villagers had allegedly sheltered the assassins of Reinhardt Heydrich, Nazi German representative in Prague, the Germans announced (June 10, 1942) that all of the inhabitants of Lidice had been either shot or deported and the village eradicated. This vengeful act aroused a world-wide storm of resentment. On July 12, 1942, the Federal housing project at Stern Park Gardens near Joliet, Ill., chiefly inhabited by compatriots of the victims, was renamed Lidice. Other cities also christened towns, suburbs, and streets in honor of Lidice.